



FOCALES

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The environmental challenges facing a Chinese oil company in Chad

Edited by

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Focales

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The authors

Foreword

This book is one of the outcomes of the work carried out within the network for Applied Research on Mining, Oil and Gas Activities (NARMA).^[1] Several members of this network, including the coordinators of this book, participated between 2007 and 2009 in the work carried out by the independent scientific panel on oil and gas activities in the Islamic Republic of Mauritania.^[2]

Little by little, this panel's work led to the conclusion that our customary references in environmental oil regulations, borrowed from major Western firms, were inadequate to deal with Chinese companies. Thus, during discussions with CNPC's representatives in Mauritania, it became obvious that we knew virtually nothing about the way Chinese public oil companies managed the environmental aspect of their business, particularly when working outside China, and especially in Africa. We were therefore completely unprepared.

It was this awareness that sparked off the research project on the CNPC in Chad, the main results of which are presented in this book. It was undertaken in partnership with the CIRAD, UIBE and the GRAMPTC and with help from the CERDI and IDREC. The research was funded by the AFD. We have sought to present a work that makes up a consistent whole while also providing for an individual reading of the various chapters.

Geert van Vliet and Géraud Magrin

[1] The NARMA network encourages dialogue on extractive activities between resource persons in the corporate sector, governments, civil society and research.

[2] The scientific panel was launched by the Mauritanian government with the backing of the Business and Biodiversity programme of the International Union for the Conservation of Nature (IUCN) and its office in Nouakchott (cf. van Vliet *et al.*, 2008, 2009b).

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Summary

This book analyses the factors that influence environmental management by the CNPC when operating outside of China, in the outer margins of the world oil system, specifically in Chad, a Least Developed Country (LDC). Within a sector marked by the regulations inherited from the Exxon project in Doba (launched in 2000 with initial World Bank support), the 2007 CNPC Rônier project aims to refine part of the extracted oil locally and export the remainder, most probably through the pipeline built under the Exxon Doba project. The question of the compatibility between the frames of reference and practices in both firms thus arises. Through the prism of social and environmental responsibility (SER), this text analyses the challenges posed by the interaction between Chinese oil firms, host countries and the major Western oil firms.

Résumé

Ce livre aborde les facteurs qui influencent la gestion environnementale de la CNPC lorsqu'elle opère à l'étranger, dans les confins du système pétrolier mondial, notamment dans un pays moins avancé (PMA), le Tchad. Dans un contexte pétrolier marqué par le projet Exxon à Doba (lancé en 2000 avec l'appui de la Banque mondiale), le projet chinois Rônier, initié en 2007, vise à raffiner sur place une partie du pétrole extrait et de transporter le reste *via* un itinéraire qui empruntera probablement l'oléoduc du projet Exxon Doba, posant ainsi la question de la compatibilité entre les référentiels et pratiques des deux firmes. À travers le prisme de la responsabilité sociale et environnementale (RSE), ce texte aborde les enjeux de l'interaction entre firmes pétrolières chinoises, pays d'accueil et *majors* occidentales.

Introduction

Introduction

Geert van VLIET

This book aims to contribute to the overall understanding of those factors that influence the way in which Chinese extractive companies comply with environmental regulations.^[3] It is sourced from research carried out on a project conducted by CNPC, a Chinese state-owned oil company operating in Chad, which is an African LDC located on the margins of the global oil system.

An overriding view^[4] holds that lower environmental and social standards constitute a competitive edge for Chinese companies exploiting African natural resources compared to their Western competitors, who have the advantage of their earlier establishment in Africa and their advanced technologies. Our purpose is to verify this assumption based on a case study of the environmental regulations implemented by CNPC in Chad. Are the Chinese state-owned oil companies using these less stringent social and environmental standards as a means of gaining ground on territory so far occupied by Western majors? Or, on the contrary, is CNPC using the notions of social and environmental responsibility (SER) to enhance its international competitiveness? What determines their policy towards host country governments and Western companies?

Our research lies at the intersection of three different lines of study. The first involves the debates on China's growing presence in Africa since the early 2000s (Cole, 2003; *Le Monde diplomatique*, 2005; Holslag, 2006, 2007; Alden, 2007; Alden *et al.*, 2008; Gu *et al.*, 2008; Michel and Beuret, 2008, *The Economist*, 2008), particularly in the form of foreign direct investment (FDI) (Jenkins and Edwards, 2006; Cui and Jiang, 2009^[5]). The second line covers the implications of emerging environmental regulations in China and their effects on changes in corporate managerial practices. (Zeng *et al.*, 2005). The third line encompasses a wider debate on the "natural resource curse" and its supposed effects, particularly in LDCs (Rosser, 2006).

[3] We understand that environmental regulations refer to the drawing up and implementing of a series of imposed or voluntary rules, be these formal (laws, policies, codes) or informal (customs, social pressure), in the private or public sphere, with a view to limiting access to natural resources or changing the way these are used.

[4] Presented, for example, by Soares de Oliveira, 2008.

[5] According to Cui and Jiang (2009), 12% of Chinese FDI was invested in Africa (very close to the amount of Chinese FDI invested in Europe).

China's growing presence in Africa adds to the controversies within African societies and their ruling classes. Alden (2007) points up three different phases: (i) a period of intense activity during the liberation struggles and the years following independence (1960s and 1970s); (ii) followed by a slackening-off in the 1980s (when China concentrated on developing the Four Modernisations policy introduced by Chairman Deng Xiaoping and, in particular, its opening-up to the influx of foreign capital), then (iii) the phase of rediscovery in the 1990s (Jenkins and Edwards, 2006). This return to Africa was further strengthened by Chairman Hu Jintao, who exhorted the larger state-owned companies to invest in overseas operations and engage more actively in international economic and scientific competition (Finkelstein, 2009). This was part of the "going-out" strategy aimed at strengthening China's capacities for more sustainable and equitable development (*ibid*, 2009). The Chairman's behest was accompanied by a raft of incentives, and the financial institutions responsible for managing these were given an increasingly important role (investment funds, development banks). China's presence in Africa has developed through various channels: individual migrants, small and medium enterprises (SMEs) and transnational companies (often state-owned) operating notably in the mining and oil industries (Cole, 2003; Alden, 2007; Chen, 2008; Perrett, 2007; Heinrigs, 2007; Munson and Zheng, 2010).

Again according to Alden (2007), African governments and African people have differing perceptions of China, regardless of its declared aims or the actual effects of its actions. It has been variously perceived as a "*development partner*", "*competitor*" and sometimes even as a "*colonizer*". Alden (2007:59) also highlights China's ability to adapt to the diverse political regimes that its players have to deal with (illegitimate states, weak democracies with economies based essentially on commodities, or democracies with diversified economies). This adaptability conjures up the image of a China prepared to go to any lengths in order to gain access to resources, as illustrated by its extremely rigid adherence to the principle of non-interference (see the argument developed by Soares de Oliveira, 2008), despite the fact that China's presence can only become firmly rooted in a peaceable context (Lee and Shalmon, 2007). For Soares de Oliveira, Chinese firms are impervious to pressure from Western non-governmental organisations (NGOs) and focus above all on demands from the African elites (to facilitate their entry and continuity in these countries) and from multilateral organisations, particularly those likely to influence China's integration into the global market (Soares de Oliveira, 2008). Alden (2007) defends the idea that a lasting Chinese presence depends on two tightly related factors: on the one hand, the reaction of the African elites and peoples to China's presence and, on the other

hand, growing pressure from the Chinese government on Chinese companies working abroad, particularly in Africa, to change their behaviour.^[6]

Since the 1990s, China has been increasingly involved in global debates and exchanges and found itself directly facing environmental impacts on its own territory. Whatever the causes of these impacts,^[7] there is a growing consensus in China that the environment needs to be better protected. Thus, the People's Congress approved the *Law on Cleaner Production* in June 2002 (National People's Congress, 2002a), which targets a more rational use of energy and raw materials. In October 2002, the Congress approved a law making environmental impact assessments (EIAs) mandatory (National People's Congress, 2002b).^[8] A comparative study reveals the progress brought about by this law compared to a European Union directive on the same theme, particularly due to the requirement to undertake a strategic environment assessment (SEA) and also because it includes policy measures in its scope (Chen *et al.* 2007). Despite implementation problems, these laws have disseminated the theory and practice of corporate environmental management. Thus, Peiyuan (2005) studies environmental management monitoring practices in companies across seven industrial sectors in China. He concludes that, while environmental reporting may not be totally accepted, the awareness of environmental impacts has clearly made considerable headway among company managers. Geng *et al.* (2008) compared intentions with the actual implementation of the "circular economy" concept at the regional level and came to the conclusion that this could be significantly improved if the regions were more involved in defining what the term "circular economy" meant to each of them individually. Recent environmental regulations in China are sending out very clear policy signals, which are further bolstered by dissuasive fiscal measures particularly for large companies (more exposed to governmental restrictions) wherever

[6] "In order to forestall criticism, the Chinese authorities decided to draw up their own ethical charter on the eve of the Beijing Summit in November 2006. This comprises nine new principles applicable to state-owned and private Chinese companies working abroad: comply with local legislation, answer tenders with complete transparency, respect the labour code of the local employees, protect the environment, amongst others." (Michel and Beuret, 2008:320). The North-South report (Brandt, 1980), although prepared without the involvement of Chinese representatives, seems to have taken on a new life.

[7] While this impact is certainly the consequence of an increase in Chinese production in response to internal demand, it is also due to the role that China plays as the world's workshop. Consumers of Chinese products abroad suffer job losses as a result of national production being relocated, but at the same time, they enjoy cheaper imported Chinese products. Moreover, as a result of relocation, adverse environmental impacts and their resolution are left to China to deal with.

[8] The first article of this law refers to the goal of aspiring towards "sustainable development" within a broad context that takes account of the need to redistribute the fruits of growth. However, the concept of a "circular economy", which is more restricted and focused on engineering, was sometimes preferred in the official discourses, which reflects the internal debates in China on these issues.

these may be operating (in China or abroad; OECD, 2008). There is thus a growing number of studies that examine how environmental regulations are implemented and enforced by Chinese companies within China (Sims, 1999; Mol and Liu, 2005; Peiyuan, 2005; Shi and Zhang, 2006; Gang, 2009; Tsang and Kolk, 2010).

However, the question of what concrete impact these dynamics have on Chinese operations abroad is rarely dealt with in the literature (Bosshard, 2008, addresses this topic). In certain studies, the criteria for assessing Western majors are used to analyse the behaviour of all companies regardless of their origin (cf. Reiner and Tuson, 2009). In our view, cross-border environmental management (United Nations, 2004; Christiansen and Garcia, 2004; Garcia *et al.*, 2009), particularly in the China-Africa context, should be examined in light of the practice of “double standards”,^[9] which is denounced by the report of the North-South Commission (Brandt, 1980). This notion can in fact be of use when analysing the behaviour of “Northern” countries operating in a “Southern” less developed country. Its utility is however more dubious when the notion is applied to a “Southern” emerging country operating in another less developed “Southern” country. This is so because, on the one hand, the design and implementation of norms and standards in China is a relatively recent phenomenon and enforcing them still poses many huge challenges. And on the other hand, the LDC – in this case, Chad – already has a history of environmental regulation inherited from its past oil experience with Western companies. Consequently, the asymmetry associated with “double standards” may not materialise as expected. Besides, studying a company in the oil and gas sector further complicates matters as it leads into the debate on the paradoxical effects of exploiting natural resources.

In the literature, it was notably Rosser (2006) who synthesised the “*resource curse*” hypothesis. The debate on this common but controversial subject centres on how revenues from extractive activities contribute to three sometimes closely interrelated phenomena: (i) weakened economic performance; (ii) institutional failings (Engerman and Sokoloff, 2002), worsening situations of “*low governability*” (Matus, 1987; van Vliet, 1997) and a tendency towards authoritarian regimes (Collier and Hoeffler, 2005a and 2005b); and (iii) the intensification and prolongation of conflicts (Ross, 1999; Humphreys, 2005; Rosser, 2006; Guesnet *et al.*, 2008). Drawing on Kloff and Wicks’ research (2005), Magrin and van Vliet (2009) suggest adding a fourth environmental

[9] The notion of “double standards” refers to the practices whereby Northern companies apply less stringent standards when operating in southern countries where the legislation is less strict than in their home country. These companies take advantage of this differential, at the same time arguing that they are acting in compliance with the host country’s national legislation.

dimension to the debate on the resource curse. This counterintuitive idea has definite advantages. It has encouraged a convergence of research work from diverse disciplines and helped to explain the unexpected effects of sudden windfall revenues gained from natural resources, particularly in LDCs with already fragile governance. Yet, the proponents of the “resource curse” hypothesis are not always convincing.

Studies based on national-level econometric data and models often confuse correlation and causality (Rosser, 2006). The proponents of the hypothesis lay an emphasis on “trends” and tend to minimise or exclude events and situations that do not fit (Rosser, 2006). Macro-level studies analyse the extractive system without taking into account the social dynamics operative between oil companies and local communities throughout the entire extractive cycle (van Vliet, 1998), even though the “productive” and “legitimation”^[10] functions produce differentiated effects over the course of this cycle (van Vliet and Magrin, 2007). The potential for these dynamics to create a “critical juncture” opening up alternative pathways (Capoccia and Kelemen, 2007) is ignored by resource curse studies, which tend to focus uniquely on thresholds, points of departure, pathways and unchanging trajectories (van Vliet and Magrin, 2009). Similarly, such analyses also tend to sidestep the differences arising from the geographic location of extractive activities (the conditions and effects of exploitation vary depending on whether oilfields lie at the centre or on the margins of the global oil system, in Saudi Arabia or Chad) (Magrin and van Vliet, 2009). Certainly, the “resource curse” hypothesis has its merits, but new empirical research is required (DAI, 2007) which would go beyond a focus on a trajectory to include spaces for bifurcation.

We have chosen to focus on a case study in Chad as it sheds light on the possibilities of bifurcating from a set trajectory. Chad is a newcomer of minor importance compared to the Middle East’s oil-producing countries – a “simple” case therefore and a far cry from contexts where different periods of exploitation have left multiple legacies and an associated entanglement of political configurations, as typified by the situation in Nigeria. The fact that Chad’s oil experience is recent makes it possible to study the

[10] Van Vliet and Magrin (2007) have proposed extending the differentiation between coercion and legitimisation as defined by Gramsci (Gramsci, 1975) to non-state organisations, in particular to companies. We have thus made a distinction between the core functions of production and those of legitimisation. The former vary according to the organisation under consideration. For the Government of Chad, these are sovereign functions related to security, a monopoly of violence, enforcement of law and order, collection and redistribution of resources to ensure the reproduction of these functions. In the case of an oil company, these involve extracting, transporting and marketing hydrocarbons. The functions of legitimisation also differ. For the Chadian State, it is a matter of providing public goods (social and health services, sectoral policies, etc.) and forging ties with its citizens through communication and dialogue. When it comes to companies, legitimisation involves specialised services for communication, the environment and “community development”.

initial social dynamics of the oil cycle. The geopolitical context and the history of oil production in Chad have been researched notably by Magrin (2001, 2003a, 2003b and 2006), Magrin and van Vliet (2005), Pourtier and Magrin (2005) and Maoundonodji (2009). While Chad may appear to be a perfect illustration of the resource curse (Pegg, 2009), a more in-depth study would suggest other interpretations. Improved access to education and a greater, more diversified opening-up to the outside world can help to change values, worldviews and behaviour. The emergence of a new elite, however small in number, with ties to the oil business also helps to create opportunities for bifurcation (Magrin and van Vliet, 2009). Contradictory pressures from firms (a demand for security but also social peace) may also be conducive to the emergence of a “modern” state that is able to combine its roles of coercion (widely practised) and legitimisation (an area in which the Chadian regime is taking its first steps). Companies (including Chinese firms) can play a part in creating spaces for bifurcation (van Vliet and Magrin, 2009).

The choice of company logically fell on CNPC as it had signed an agreement with the Government of Chad for the implementation of the Rônier project. The project covers the construction and then exploitation of oilfields twenty kilometres south of Bousso, as well as the construction of a pipeline to connect the oilfields to an oil refinery already under construction in N’Djamena. In future years, this refinery may also process oil from the Sedigui oilfield located to the north of Lake Chad (*via* a second planned pipeline). As a *New York Times* journalist had already foreseen in 2007, the Chinese project plans to find oil, refine some of it on the spot and ship the rest through Sudan (*New York Times*, 2007), or *via* the Exxon project pipeline. At the time of writing this book, the second option appears to be the most likely. The choice of CNPC for our research is thus all the more justified as it fits with our hypothesis that an operator is most open to dialogue on environmental management at the beginning of operations, and it is also during this initial phase that the dialogue could produce the greatest effects.

The possible link-up between the CNPC-Rônier project and the Exxon-Doba project is extremely interesting. On the one hand, if it were to materialise, the link-up would be concrete evidence of Sino-American cooperation within a common strategy to de-politicise both parties’ energy policies (Lee and Shalmon, 2007).^[11] Were China to pursue a more realistic policy, firms would then be able to enter into new forms

[11] According to Lee and Shalmon, politicised competition in energy policy would heighten tensions. As China and the USA are on the same side as oil importers, it would be in their interest to come to a common understanding when dealing with oil-producing countries (Lee and Shalmon, 2007).

of alliance (Soares de Oliveira, 2008). On the other hand, this cooperation would require tough negotiations particularly to ensure compatibility between the respective environmental norms and standards and monitoring systems; as the Exxon project complies with very advanced regulations imposed by the World Bank under pressure from international environmental NGOs and the media.

Our empirical research is based on the following principles: we used Chinese environmental regulation as a reference point; we worked in partnership with Chinese, Chadian and European researchers; recognising the complexity of our case study, we adopted a multidisciplinary approach (political science, ecology, political economy, geography, sociology of macro-organisations). Our results were further enriched by our experience on the subject of extractive industries and are based on our reading of the bibliography as well as on our fieldwork in Chad (mostly carried out from 20 June to 10 September). During this period, we undertook an observational phase, conducted semi-formal interviews and held a few preliminary feedback sessions on our work. (Van Vliet *et al.*, 2011).

We will argue that CNPC has neither the intention nor the possibility of pushing down the level of environmental regulation in Chad. Following multiple internal and external pressures, China now has an extensive system of environmental regulation, even though enforcement is still uneven. Its oil sector, which is strategically important for the State, is emblematic of the country's growing requirements. Environmental regulation is less advanced in Chad, but the degree of compliance in the oil sector is high due to the commitments made at the outset of the Exxon-Doba project and to constant pressure from public opinion and local and international NGOs. Taking the degree of enforcement of the regulations in both countries into account, local requirements are at least as high as in CNPC's home country. The context is thus favourable to a reversal of the situation depicted by the literature on "double standards". In China, CNPC has gradually narrowed the gap between the demand and supply of environmental regulations. It has pragmatically adapted to the regulatory environment of the host country and to the institutional legacy of the Exxon-Doba project. Yet, the company's lack of dialogue means that it is unable to give visibility to the progress it has achieved in order to evidence its international competitiveness.

To underpin our arguments, we will describe the evolution of Chinese environmental regulation, the background to its emergence, the progress made, the limits to its implementation, as well as the resulting obligations for the oil and gas industries (Part 1). We will then analyse the regulatory framework in which CNPC has had to operate since it arrived in Chad, as well as the country's history of environmental

regulation, bringing out the importance of the institutional legacy left by the Exxon-Doba project even after the World Bank's withdrawal from the project (Part 2). We will then describe the CNPC Rônier project and the economic, social and environmental challenges it presents for the various stakeholders (Part 3). After analysing the environmental regulatory frames of reference chosen for the CNPC Rônier project, we will broach the mechanisms and practices of CNPC's environmental management in Chad as formalised in its HSE approach,^[12] as well as its responses to the initial impacts of the project. Our analysis focuses particularly on the environmental issues raised by CNPC's eventual use of the pipeline managed by the Exxon-led consortium (Part 4). To conclude, drawing on available secondary data, the last chapter provides a comparison of CNPC's environmental management in three countries (Sudan, Niger and Chad) in the Sahel region (Part 5).

[12] The environmental policies of extractive companies are normally set out in the approaches, procedures and tools called HSE ("Health, Safety, Environment").

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Part One

1. The emergence of environmental regulation in China: its limits and implications for the petroleum sector

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1.1. Introduction

This chapter aims to provide an understanding of the context that has shaped the approach to environmental issues in the Chinese petroleum sector.

Since the launch of Deng Xiaoping's modernisation reforms in 1978, economic growth has been remarkable but has nonetheless exerted huge pressures on the environment. For over thirty years, China's annual economic growth rate has averaged over 9.5%, giving rise to rapid industrialisation, improved living standards for citizens, substantial poverty alleviation and rapid urbanisation (urban population accounted for 46.6% of total population in 2009) (State Statistics Bureau, 2010). The fast-paced economic growth, industrialisation and urbanisation rapidly outgrew the existing raft of environmental rules of the game, some of which were inherited from the past. Negative environmental impacts generated enormous economic costs and were soon widely perceived as one of the main constraints to China's future development. They also were one of the main reasons for citizen protests^[13] against the polluters and public authorities (Economy, 2005). Environmental issues gained even more importance when the State implemented its "going-out" policy. Abroad, Chinese firms were confronted with new market demands (from business partners, suppliers and service providers) and new environmental rules (imposed by foreign public regulatory agencies). Thus,

[13] Thus confirming a trend observed in other countries, in which environmental issues tend to channel demands that can find no adequate expression or response elsewhere.

the problems that were first viewed as simply “Chinese” environmental issues, very soon turned regional (transboundary air and water issues, sea pollution and desertification) or global (greenhouse gas emissions, global warming and climate change) (OECD, 2007 ; Gang, 2009). This state of affairs was progressively internalised by national, regional and local authorities, enterprises, the Chinese Communist Party and citizens, and responses were thus crafted and implemented in the shape of environmental regulation.

Initially, research had helped to establish a diagnosis of environmental problems but it subsequently broadened out to include analyses of the successive steps taken in the formulation of new environmental regulations (Cai, 1988; Yuan, 1990, Day, 2005; Ferris and Zhang, 2005). Once this thrust was underway, research studies gradually focused on the reasons for the low levels of compliance, specifically in the public sphere (OECD, 2006; Economy, 2005; Gang, 2009).

The Chinese petroleum sector is one of the flagships of the national economy. Across the country, oil exploration, production, transport, refining and distribution remain under the control of state-owned oil companies. To fuel rapid economic development and satisfy an increasing energy demand, the petroleum sector ranks among the top ten priorities of the government’s development strategy. Yet, while there is an abundant literature on the environmental regulation of oil activities in Western countries, less is known^[14] about the way in which Chinese oil companies are environmentally regulated, whether by the State or through the voluntary adoption of standards, principles and norms. A few authors have nonetheless opened the way: Guo (2006) discusses the relationship between the government and national oil companies with respect to their business development; Dong *et al.* (2006) provide an initial analysis of environmental laws and their influence on China’s petroleum industry; and Downs (2007) focuses on what the national oil companies have learnt during their ventures overseas.

In this chapter, we will try to answer the following questions: beyond the effort involved in producing environmental regulations, what makes it difficult to govern environment-related issues in China today? Is the gap between the rules and their enforcement also to be seen in the petroleum sector?

In order to answer these questions, we will first analyse the reasons behind the emergence of overall environmental regulation in China, as well as its main charac-

[14] This is surprising, because oil exploration and production had already started in China in the late forties.

teristics. We will then focus on the obstacles to its enforcement and examine three sets of explanations (player-related factors, rule-related factors and factors inherent to regulation itself). This will enable us to explore the specific factors leading to the emergence of environmental rules and what characterises their enforcement in China's petroleum industry.

1.2. The emergence of environmental regulation in China

1.2.1. Background

Environmental regulation in China has millenary roots. During the Western Zhou Dynasty (eleventh century B.C.), the government promulgated rules banning deforestation and limiting hunting and logging periods (Yuan, 1990). During the Qin Dynasty (221–206 B.C.), the Land Law (*Tian lu*) contained provisions for the protection of natural resources. In addition to such laws, other forms of regulation also existed. For instance, Taoism (developed by the philosopher Laozi around 500 B.C.) emphasised the harmony between humans and nature and, alongside the regulations issued by the authorities, Chinese people of all nationalities^[15] developed specific forms of environmental regulation based on their own customs and practices. Over the following millennia until the end of the last dynasty and the foundation of the Republic of China in 1911, there was almost no further development of official environmental regulation in China. Various environmental laws were enacted by the nationalist government, including a Fishery Law (1929), a Land Law (1930), a Forestry Law (1932), a Hunting Law (1932) and a Water Conservancy Law (1942). However, the drive towards environmental legislation and its implementation was severely disrupted by recurrent warring and unstable political conditions. Moreover, many of the regulations were ill suited to address the rapidly changing nature of environmental issues and their subsequent magnitude.

With the foundation of the People's Republic of China in 1949, China entered into a planned economy regime in which pollution problems were mainly seen as hygiene concerns requiring the prevention of occupational diseases. As was the case for all other questions, environmental issues were guided or regulated by editorials in the *People's Daily* (the Party's official newspaper), and major decrees from the Party's Central Committee, the State Council or various government departments (or ministries). For instance, the Health Ministry and the State Construction Committee

[15] The Chinese population comprises more than fifty "minority nationalities" of which the "Hans" are the largest in number.

jointly issued a Provisional Standard for Industry Enterprises Design in 1956. Although this was vague and non-binding, it is considered as one of the first attempts at regulation in the area of pollution control. Regarding natural resources, the government issued several decrees and regulations to protect forest and mineral resources and to prevent water and soil erosion. Likewise, the different departments of the State Council promulgated a series of key decrees in response to specific environmental problems that the country encountered at different points in time (Cai, 1988). The government's efforts to protect the environment were interrupted by the onset of the Cultural Revolution in 1966. During these years, political struggles occupied centre stage, overshadowing both environmental concerns and economic development issues.

Central planning left its mark on public policymaking. In 1953, the government introduced the first Five-Year Plan (FYP) to steer the development of the national economy during the period 1953-1957. Local governments then prepared their own annual five-year plans that set out their development objectives in line with the FYP of the government tier immediately above them. (Ferris and Zhang, 2005).

Environmental decrees and policies were transmitted to the local government level for execution. Grounded in a control-and-command approach and implemented through almost military-style campaigns, these policies were remarkably effective under a highly centralised system of planning, as illustrated by the nation-wide campaign against contagious diseases in the early 1950s, and the large-scale hygiene campaign to eliminate "the four pests" (rats, sparrows, flies and mosquitoes) in 1958. By mobilising the entire population, these campaigns achieved their stated goals. Throughout the pre-reform period (prior to 1978), the government also relied heavily on mass mobilisation and campaigns to address economic, political and environmental issues, and this approach still has a deep influence on the way environmental issues and their regulation are managed today in China.

A precursory sign of China's opening up to external debates on the environment came in 1972, when the country attended the United Nations Conference on the Human Environment (UNCHE) for the first time. In June of that year, the State Council established a leading group for the water resource protection of the Guanting Reservoir, which can be considered as China's first water pollution control project. In August 1973, the State Council held the first national conference on environmental protection and promulgated a first raft of environmental regulations on Environmental Protection and Improvement (a provisional project), thus establishing the fundamental principles of environmental protection. In May 1974, the State Council set up an inter-ministerial group for environmental protection, tasked with producing a comprehensive inventory of China's environmental problems. At the same time, all local governments were

required to establish a “Three Wastes” bureau, which was the first local-level environmental institution and an embryo of the subsequent local Environmental Protection Bureaus (EPBs) (Economy, 2004).

The year 1978 marked the beginning of a gradual introduction of market mechanisms into the Chinese economy and a policy of opening up to international trade. During this transition period, the coexistence of a central planning system and market mechanisms as well as China’s increasing participation in the international community had a significant impact on the orientation of the State’s environmental policies, the choice of policy instruments and the strategies adopted by firms and NGOs.

Given the growing environmental issues and their financial and political consequences, some of the more perseverant Party members finally gained acceptance for the idea of introducing a legal system that had comprehensive and detailed environmental rules, in order to ensure a more environment-friendly development path. In December 1978, the Party’s Central Committee amended the key points of the State Council’s Environmental Protection Report, which contained precise instructions for the draft environmental legislation. China’s first environmental law, the Environmental Protection Law was passed by the Fifth National Congress on 13 September 1979. Meanwhile, the Congress had been working on the reform of the Constitution. The revised text, which formalised environmental protection in three essential articles,^[16] was adopted in 1982 and set the stage for China’s new venture into environmental regulation.

1.2.2. *The main players in environmental regulation after the 1982 constitutional reform*

The role of the State and local authorities in public environmental regulation

According to the Constitution of the Chinese People’s Republic (1982) currently in force, the National People’s Congress (NPC) is the highest organ of State and exercises the legislative power. Within the NPC, there are nine specialised advisory committees

[16] The Constitution explicitly mentions in Article 9: “Mineral resources, waters, forests, mountains, grassland, un-reclaimed land, beaches and other natural resources are owned by the State, that is, by the whole people, with the exception of the forests, mountains, grassland, un-reclaimed land and beaches that are owned by collectives in accordance with the law. The State ensures the rational use of natural resources and protects rare animals and plants. The appropriation or damage of natural resources by any organisation or individual by whatever means is prohibited”. Article 12: “Socialist public property is sacred and inviolable. The State protects socialist public property. Appropriation or damage of State or collective property by any organisation or individual by whatever means is prohibited”. In Article 26, “the State protects and improves the living environment and the ecological environment, and prevents and controls pollution and other public hazards. The State organises and encourages reforestation and the protection of forests.”

Source: <http://english.peopledaily.com.cn/constitution/constitution.html>, accessed 15 April 2011.

working under the supervision of a standing committee when Congress is not in session. Among these advisory committees, the Environmental Protection and Natural Resources Conservation Committee organises the formulation and review of bills on environmental and resource protection, oversees their enforcement and can request amendments (Liu, 2008). The Committee also takes part in exchanges with foreign parliaments on the subject of environmental and resource conservation (SEPA, 2001; Jahiel, 1998; Ferris and Zhang, 2005) and approves the Five-Year Plans inherited from the pre-reform period. In fact, despite the gradual introduction of market-based mechanisms, the FYP (which is a political but legally binding plan) still constitutes the cornerstone of government policy. The scope of the FYP has even been extended to encompass not only economic, but also social and environmental spheres.

The State Council is the executive authority in the Chinese State system. Under the State Council, eight agencies^[17] with ministerial rank have direct or indirect responsibility in environmental matters. Among them, the National Development and Reform Committee (NDRC, the planning ministry) plays a key role as the body responsible for developing and implementing FYPs. In this capacity, the NDRC integrates environmental issues into China's overall planning system and into sector-specific policies (e.g., on energy) and promotes clean production in key industries (Liu, 2008). The NDRC can issue administrative directives on economic, social and environmental matters (for example, price control for key natural resources such as coal, water and oil). It can also launch environmental investigations and intervene in case of environmental emergencies.

Under the State Council, the Environmental Protection Committee (EPC) brings together the highest representatives of those ministries, departments and commissions that have an influence on environmental issues.^[18] The EPC is the State Council's coordination agency for implementing environmental protection actions. The EPC supervises and verifies the implementation of the environmental protection laws and regulations by the various departments and local authorities (Liu, 2008).

[17] The National Development and Reform Committee (NDRC); the Ministry of Environmental Protection (MEP); the Ministry of Land and Natural Resources; the State Administration of Work Safety (supervising the State Administration of Coal Mine Safety); the Ministry of Labour and Social Security; the General Administration for Quality Supervision and Inspection and Quarantine; the Ministry of Health and the Public Security Department.

[18] The key ministries involved in the implementation of environmental laws and policies are: the Ministry of Water Management, the Ministry of Land and Resources; the Ministry of Agriculture; the Ministry of Forestry; the Ministry of Health; the Ministry of Construction; the Ministry of Communications; the Ministry of Supervision. Other government agencies involved in the implementation of environmental policy include: the State Forest Administration; the State Oceanic Administration; the China Meteorology Administration; the National Bureau of Statistics (Ferris and Zhang, 2005).

Overall oversight and administration of the country's environmental protection actions are carried out by the Ministry of Environmental Protection (MEP), which was created out of the State Environmental Protection Agency (SEPA) in March 2008. The MEP's functions include preparing and implementing national policies, legislation and regulations related to water and air quality, solid waste management, nature conservation and nuclear/radiation safety. The MEP^[19] is also responsible for setting environmental quality criteria and pollutant discharge/emission standards at the national level, organising environmental quality monitoring and initiating enforcement activities together with local environmental authorities. The MEP coordinates plans for addressing transboundary environmental problems and organising scientific research and development (Liu, 2008).

Local people's congresses play a key role in the implementation of environmental policy (OECD, 2006). They can discuss and decide on issues related to the protection of the environment and natural resources and issue local regulations, provided the latter do not contravene the Constitution, applicable national laws or administrative and ministerial regulations (Jahiel, 1998; NPC, 2004). Environmental Protection Bureaus (EPBs) exist at the following levels of local government: provinces, autonomous regions and centrally administered municipalities; prefecture-level municipalities; districts, counties, county-level cities and large townships (OECD, 2006). Economy (2005) pointed out that the main responsibilities of EPBs include: overseeing environmental impact assessments (EIAs) and other procedures for new development projects; monitoring polluting discharges from industries; setting fees for such discharges; initiating legal action against firms that fail to meet environmental requirements; and environmental reporting, environmental education and awareness-raising activities. According to the OECD, *"there are about 2,000 Environmental Protection Bureaus (EPBs) with approximately 60,000 employees at the provincial, prefecture/municipal, district/counties, and township administration levels"* (OECD, 2006).^[20]

However, there are also other local agencies that influence environmental protection (OECD, 2006). Through their coordinating role, the planning commissions at county level or above can influence the work of the EPBs and other local agencies. A substantial number of local governments have created industrial bureaus, some of

[19] The MEP comprises the following offices, bureaus, departments, and committees: administrative office; Department of Planning and Finance; Department of Policies, Laws and Regulations; Department of Human Resources Management; Department of Pollution Control; Department of Nature Conservation and Ecology; Department of Nuclear Safety; Department of EIA Management; Bureau of Environmental Supervision, Department of International Cooperation; and the Communist Party Committee (Liu, 2008).

[20] EPBs at the provincial level employ, on average, 24 staff, 32 at the city level and 35 at the county level.

which incorporate Environmental Protection Divisions (EPDs). Local governments have also created finance bureaus that *“manage city revenues and expenditures and play important roles in the pollution discharge fee system”* (OECD, 2006). According to the Ministry of Environmental Protection, there were over 3,000 environmental inspection agencies in China with about 50,000 inspectors, including 633 inspectors at the provincial level, 8,164 inspectors at the prefectural level and 38,356 inspectors at the county level (MEP, 2008).

The role of enterprises, NGOs and media

In China, the productive sector consists of state industrial and commercial conglomerates; large and medium state-owned enterprises; public utility enterprises at several levels (national, regional and local) and a fast-growing number of private enterprises (some are large, but most are medium-sized, small or micro).

The Chinese government has progressively adopted a positive attitude toward environmental NGOs. The 9th and 10th FYPs encouraged civil society and its representatives to address environmental degradation concerns and promote environmental education and awareness. The establishment of the NGO, Friends of Nature, in Beijing in 1994 laid the ground for the emergence of many other environmental groups (Wu, 2009). By the late 1990s, the influence of environmental NGOs became increasingly visible (Economy, 2004; Ho, 2001; Knup, 1997; Yang, 2005; Wu, 2009). According to ACEF (2006), by the end of 2006, there were more than 2,700 environmental NGOs with a total staff of over 20,000 active volunteers. These NGOs can be classified into four categories: government-organised NGOs, civil NGOs, student environmental groups and associations and branches of international NGOs (ACEF, 2006).

Over the past decades, there has been a dramatic upsurge in the level of the general public's and the media's interest and involvement in environmental conservation (OECD, 2006). In many cases, the public acts as a watchdog by submitting complaints to local officials. According to the OECD (2006), the media are encouraged *“to participate in enforcement campaigns to increase pressure on local enterprises and officials and inform the public throughout China about SEPA's efforts and the results of inspections... In several provinces, environmental telephone ‘hotlines’ exist that allow citizens to report non-compliance so that government agencies can undertake quick enforcement actions”* (OECD, 2006). Supervision by citizens and the media is increasingly appreciated by environmental authorities as a means of reinforcing the capacity for overseeing activities that could cause environmental damage (OECD, 2006).

1.2.3. Public environmental regulation

Public rules and standards

In addition to the Constitution, two environmental laws provide the underpinnings for the state environmental regulation system.^[21] The draft Environmental Protection Law (EPL) was prepared in 1979 and came into effect in 1989 after a ten-year trial period. The EPL, which lays out the general principles for environmental protection and describes the key instruments for environmental management, established the founding principle for coordinated development between economic construction, social progress and environmental protection. It defined the rights and duties of all levels of government, companies and individuals with regard to environmental protection. Based on the “three synchronisations” (3S) principle, the EPL requires enterprises that construct facilities emitting pollutants to comply with applicable environmental standards and to design, build and commission technologies for the prevention and control of pollution at the same time as the main part of the construction project. Besides recognising the right of organisations and individuals to report non-compliances, the EPL specifies the roles of national and local government levels in the implementation of the environmental policies (OECD, 2006).^[22]

The second overarching law that affects all sectors is the 2002 Environmental Impact Assessment Law (EIA Law). This Law requires any project with potentially harmful environmental effects to be validated by an environmental impact assessment prior to its construction phase, and to put in place all the necessary environmental protection measures as soon as construction begins. The environmental assessment involves identifying and analysing possible environmental incidents; it includes measures to prevent or control the identified impacts, and an assessment of the feasibility and costs of such measures. This Law is the first to openly invite the public and all project stakeholders to participate in public hearings on environmental assessment. The State Environment Protection Agency (SEPA) (restructured as the MEP in 2008) issued the

[21] Although all authors concur that the cornerstone of the environmental system is the Constitution, the way in which they structure, classify and present its complexity is nuanced. According to Lan (2002), the Environmental Protection Law and the Law on Environmental Impact Assessment encompass two groups of laws: laws on the prevention of pollution and laws on biodiversity and ecosystem conservation. The first group includes laws aimed at preventing the pollution of natural resources (such as the specific law on water and air) or laws intended to prevent or reduce pollution by toxic or hazardous materials (such as the Law on Solid Wastes). The second group comprises laws designed to protect bioresources (protection of wildlife and plants), laws on the protection of human and historic environments (a regulation on the protection of scenic sites) and non-bioresources (the Mineral Resources Law). These laws then translate into national and local administrative norms and decrees (Lan, 2002).

[22] For the full English translation of the EPL see:
http://english.mep.gov.cn/Policies_Regulations/laws/environmental_laws/200710/t20071009_109928.htm

“Measures on Public Participation in the Environmental Impact Assessment Process” (in effect as of March 2006). These measures *“clarify the rights and responsibilities of various parties with an interest in the EIA and the forms of public participation, including surveys, consultations, seminars, debates and hearings”* (OECD, 2006). The 2002 EIA Law has two specific features: it imposes broad Strategic Environmental Assessments (SEAs), which go further than simple project-level EIAs, and assesses the policymaking process itself from an environmental point of view. This means that government authorities at all levels are required to demonstrate that they take environmental impacts into account for each proposed policy measure. The Law also exceeds the requirements set forth in the European Union’s directive on environmental impact evaluation (Chen *et al.*, 2007).

In addition to these two founding laws, China has elaborated a comprehensive raft of sector- or issue-specific regulations since 1978, which have been extensively mapped by the OECD (OECD, 2006). Here, we will mention: the Marine Environmental Protection Law (1982, amended 1999); the Forestry Law (1984, amended 1998); the Law of the People’s Republic of China on Prevention and Control of Water Pollution (1984, amended 1996); the Grasslands Law (1985); the Fisheries Law (1986); the Mineral Resources Law (1986, amended 1996); the Land Administration Law (1986, amended 1998); the Air Pollution Prevention and Control Law (1987, amended 1995, 2000); the Wildlife Protection Law (1988); the Water and Soil Conservation Law (1991); the Law of the People’s Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (1995); the Law of the People’s Republic of China on Prevention and Control of Pollution from Environmental Noise (1996); the Flood Prevention Law (1997); the Energy Conservation Law (1997); the Desertification Prevention Law (2001); the Water Law (1988, amended 2002); the Clean Production Promotion Law (2002) and the Radioactive Pollution Prevention and Control Law (2003) (OECD, 2006). In recent years, to promote a balanced development model based on the notion of a “harmonious society” and the “scientific concept of development”, the government has set environmental protection as one of its top priorities^[23] and adopted a more proactive and systemic management approach covering entire processes; it thus enacted the Law on Renewable Energy (2005) and the Circular Economy Promotion Law (2009)^[24] (OECD, 2008).

[23] Decision of the State Council on Implementing the Scientific Concept of Development and Strengthening Environmental Protection (State Council, 2005).

[24] See the official website of the Chinese Ministry of Environmental Protection: http://english.mep.gov.cn/Policies_Regulations.

A number of non-environment related laws nevertheless contain provisions that are relevant to environment. China's General Principles of the Civil Law (1986) and the Criminal Law of the People's Republic of China (2006) establish the civil and penal liabilities of polluters who are responsible for pollutions with severe human, economic or environmental damages. Economic laws, such as the Law of the People's Republic of China of Industrial Enterprises Owned by the Whole People (1988), the Township Enterprises Law (1996) and the Agriculture Law (2003) stipulate firms' responsibilities in the prevention and control of environmental damages.

At the state level, the Chinese government has likewise promulgated *"more than 30 administrative decrees regarding environmental protection, including Regulations for the Prevention and Control of Noise Pollution; on Nature Reserves; on the Prevention of and Protection Against Radiation from Radio Isotopes and Radioactive Devices; on the Safe Administration of Chemicals and Other Dangerous Materials; on the Prevention and Control of Water Pollution in the Huai River Drainage Area; on Environmental Protection Administration in Offshore Oil Exploration and Development; on the Control of Marine Wastes Dumping; for the Implementation of the Protection of Terrestrial Wildlife; on the Administration of National Parks; on the Protection of Basic Farmland"* (State Council, 1996).

At local level, people's congresses and people's governments have enacted and promulgated more than 600 local laws on environmental protection (Ferris and Zhang, 2005). These local laws and regulations not only improve the fit between far-removed national rules and local circumstances, but also send strong national policy signals to local regulatory practices (Ferris and Zhang, 2005).

China's law-making intentions in the area of environment have given rise to environmental standards (Lu, 2006).^[25] They include environmental quality standards, pollutant discharge or emission standards and basic criteria for measurement, sampling and methodology. Among the environmental quality standards, the most essential are: the Standard of Environmental Noise of Urban Area (1993); the Environmental Quality Standard for Soils (1995); the Ambient Air Quality Standard (1996); the Seawater Quality Standard (1997); the Indoor Air Quality Standard (2002); the Environmental Quality Standards for Surface Water (2002). Among the Pollutant Discharge or Emission

[25] For all recent regulations, policies and standards on environmental protection see:
http://english.mep.gov.cn/Policies_Regulations ;
http://english.mep.gov.cn/inventory/Catalogue_Standards/Catalogue for Newly-released Environmental Regulations and Standards
http://english.mep.gov.cn/inventory/Catalogue_Standards

Standards we mention: the Effluent Standard for Pollutants (1983); the Effluent Standard for Pollutants from the Petroleum Refining Industry (1983); the Discharge Standard of Water Pollutants for the Paper Industry (1992); the Integrated Wastewater Discharge Standard (1996) and the Standard for Pollution Control on Landfill Sites for Domestic Waste (1997). Among the criteria and methodologies for measurement and sampling, the most important are: Emission Standards and Measurement Methods of Railway Noise on the Boundary alongside Railway Lines (1990); the Standard of Environmental Noise of Urban Areas (1993); Limits and Measurement Methods for Emissions of Pollutants from Motor Vehicles (1999) (Lu, 2006). As provided for under Chinese law, the environmental quality standards and pollutant discharge standards (state or local) are compulsory standards, and anyone violating them must bear the consequences (Liu, 2008). This impressive legal arsenal was further reinforced by China's adhesion to international conventions and the additional obligations they created.

China participates actively in the following conventions (State Council, 2007): Convention on International Trade in Endangered Species of Wild Fauna and Flora (8 April, 1981); Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (6 September, 1985); the Vienna Convention for the Protection of the Ozone Layer (11 September, 1989); the London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (14 June, 1991); the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (4 September, 1991); the Ramsar Convention (31 July, 1992); the Convention on Biological Diversity (7 November, 1992); the United Nations Framework Convention on Climate Change (7 November, 1992); the Convention on Nuclear Safety (9 April, 1996); the Convention on the Prevention and Control of Desertification (30 December, 1996); the Amendment of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1 May, 2001); the Kyoto Protocol (1 August, 2002); the Copenhagen Amendment for Montreal Protocol on Substances that Deplete the Ozone Layer (22 April, 2003); the Stockholm Convention on Persistent Organic Pollutants (25 June, 2004); the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals in International Trade (29 December, 2004); the Cartagena Protocol on Biosafety (17 April, 2005); the Amendment of the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter (June 29, 2006) (State Council, 2007).

State, local and international regulations are then integrated into the FYPs, which form the basis for coordinating public policies and have a binding legal status. The plans for environmental protection established by the State must be incorporated into

the national economic and social development plans (Article 4, EPL). In line with the EPL, the Chinese environmental authorities have developed Five-Year Environmental Plans (FYEPs), which set environmental targets, identify priority areas and establish key indicators for environmental protection. The current 11th Five-Year Plan (2006-2010) sets broad environmental targets such as: reduce energy intensity in 2010 by 20% (as compared to 2005); reduce water consumption per unit of industrial value-added by 30%; maintain water consumption for irrigation in agriculture at current levels; increase the recycling of industrial solid wastes by 60%; maintain the utilisable agricultural area at 120 million hectares; reduce the total discharge of major pollutants by 10%; reach a forest cover of 20%; and control greenhouse gases to *"produce good results"* (State Council, 2007).

These broad goals are then translated into key indicators including: in 2010, a 10% reduction of CO₂ with respect to 2005; SO₂ reduction (-10%); a reduction of water sections under the national monitoring plan failing to meet the Grade V National Surface Quality Standard (-4.2%); an increase in the number of days during which the urban air quality in major cities is superior to the Grade II National Air Quality Standard (+5.6%); etc. (State Council, 2007). Key environment protection investment projects are then set out in the FYP, such as: capacity building for environmental supervision; hazardous and medical waste disposal; chromium slag pollution treatment; urban wastewater treatment; water pollution prevention and control; urban waste treatment; flue gas desulphurisation in coal mines, demonstration protected areas and nuclear and radiation safety (State Council, 2007).

Public instruments for implementation and enforcement

Besides the earlier mentioned instruments that rely on communication and information, the government also uses more conventional public policy instruments, some of which have been adapted from Western economic and legal instruments.

Chinese authorities use a range of market-based instruments to induce enterprises to comply with regulations. These include pollution discharge permits, fines and taxes as well as subsidies disbursed under green policies such as green credit, green insurance, green securities and green trade policy.

The Discharge Permit System (DPS) is intended to control the aggregate pollution discharges in a specified area. First, local EPBs calculate the optimal load of pollution discharges and emissions and then distribute this among the enterprises within their jurisdiction in the form of discharge permits. The enterprises producing pollution discharges have to apply for a permit from the EPBs. In order to increase the efficiency

of the system and take into account the disparities among enterprises in terms of their pollution abatement capacity, in 1991 SEPA tested the tradable emission permits in six pilot cities, Baotou, Kaiyuan, Liuzhou, Taiyuan, Pingdingshan and Guiyang (OECD, 2006).

When non-compliance is confirmed, local EPBs can issue warning letters, then impose fines or withdraw the permit for a part or the entirety of the facility. Fines or pollution charges are the most frequently applied measure, accounting for over 60% of non-compliance responses (OECD, 2006). Originally, only discharges that exceeded emission/discharge standards were subject to a fee. The regulation on the levy and management of discharge fees (2002) established a new policy for pollution charges, with all discharges being subject to fees and additional fines for discharges in excess of the standard (State Council, 2003). Polluters have a grace period after which the payments due increase; charges increase with the duration of non-compliance (OECD, 2006). According to OECD (2006), a substantial part of the levied funds were returned to enterprises for investment in pollution control and abatement, while the local EPBs were to retain the remaining funds for environmental protection activities. In practice, EPBs used the levied funds mainly to cover their operating expenses. Therefore, recently, it was decided that the revenue from collected charges would instead be transferred to the Ministry of Finance. These resources are redirected to local governments, but earmarked for environmental improvements (OECD, 2006).

Green tax instruments are used to encourage environment-friendly practices and penalise high-polluting or energy-consuming activities. Article 88 of Decree No. 512 for the implementation of the Corporate Income Tax Law (both effective 1 January, 2008) foresees tax exemptions for enterprises that invest in certified environmental protection, energy or water conservation projects (utilisation of public refuse, methane, clean production techniques). Whenever an enterprise does not respect agreements regarding pollution or consumption, it can be reclassified in a higher corporate income tax bracket.

During 2007 and 2008, SEPA, together with the relevant authority in each sector, engaged in the formulation of several “green policies” (OECD, 2008). For instance, under the “green credit policy”, commercial bank credit is granted taking environmental criteria into account: the loans may be reduced or cut off if enterprises contravene environmental laws and regulations (OECD, 2008). A “green insurance policy” was designed with the aim of establishing an environmental liability insurance system by 2015: risk-prone enterprises are required to take out insurance against pollution accidents (OECD, 2008). A “green trade policy” was announced in order to

“reduce or withdraw the export quota or licence for high-polluting or energy-consuming enterprises” (OECD, 2008). A “green securities policy” was promulgated in 2008, requiring an environmental audit and environmental information disclosure for enterprises in heavily polluting industries as a prerequisite for obtaining refinancing through the security markets (OECD, 2008).

Inspections are the main legal instrument used at central and local levels to ensure compliance. According to OECD, *“inspections are mainly carried out by the local EPBs. Private enterprises are inspected by the EPB of the jurisdiction where they are located. State-owned enterprises which are assigned a special administrative status are inspected by a respectively higher EPB”* (OECD, 2006). Inspections are more frequent for enterprises situated in cities (OECD, 2008).

A typical inspection is divided into the following steps: *“case initiation, investigation and penalty assessment”* (Ferris and Zhang, 2005). According to Ferris and Zhan (2005), *“incriminated enterprises may receive warnings, corrective action orders (with or without specific deadlines for correction), orders to report or publish specific company information, orders for victim compensation, fines, withholding of operational or import licenses, restrictions to prime materials and facility shut-down orders”* (Ferris and Zhang, 2005).

In addition to the administrative penalty process, environmental law violators may also be prosecuted under civil and criminal law (Ferris and Zhang, 2005). Thus, Article 6 of the Environmental Protection Law and several provisions in the Civil Law provide affected parties with opportunities *“to take environmental disputes to court and to take legal action against polluters”* (OECD, 2006). Under the Administrative Law, local governments or local EPBs can be sued for negligence in fulfilling their environmental duties. For serious offences, China’s Criminal Law stipulates up to three years imprisonment and/or a fine for individuals involved in illegally discharging pollutants.

1.2.4. *Enterprises and voluntarily adopted rules and standards*

To complement these potentially very dissuasive market-based and legal measures, the government also encourages enterprises to voluntarily adopt environmentally responsible behaviours, such as clean-production methods, resource-saving technologies and international environmental standards. Enterprises may also be incentivised to adopt environmentally responsible conduct in order to improve their corporate image and gain access to international markets.

China adhered to the International Organization for Standardization (ISO) in 2001 and is represented by the Standardization Administration of China (SAC). The main function of the SAC, as authorised by the State Council, is to ensure overall coordination of standardisation activities in China.^[26]

SAC actively promotes clean-production certificates and environmental labels, as well as the adoption of process standards such as the ISO 14000 Environmental Management System certification. As a process standard, ISO 14000 articulates all the components of an organisation's environmental management systems.^[27] In particular, it requires organisations to formulate an environmental policy, set objectives and targets, develop an implementation plan, monitor and measure the system's effectiveness, correct problems and conduct reviews to improve the system (Petroni, 2001; Barla, 2007). The Chinese government encourages enterprises to adhere to a variety of other voluntary standards and norms in all sectors.

1.3. Effectiveness of environmental regulation in China and explanatory factors

1.3.1. *Real progress*

The efforts to develop the environmental enforcement framework have yielded results in China's environmental management and pollution control.

The "Three Synchronisations" (3S) programme has played an important role in stimulating investment in pollution abatement installations at industrial enterprises, especially in new factories. In 2004, according to the OECD (2006), out of a total of 127,500 investment projects, 79,500 were subject to the "3S" procedure. In slightly more than 76,000 cases, the "3S" procedure was approved (OECD, 2006). By 2006, over 5,000 enterprises in the sectors of chemicals, light industry, power-generation, coal, machine-tools and building materials had met the clean production requirements. More than 12,000 enterprises across China had received the ISO 14000 Environmental Management System certification, while over 800 enterprises and over 18,000 products

[26] Source : ISO, http://www.iso.org/iso/about/iso_members/iso_member_body.htm?member_id=1635, accessed 22 April 2011.

[27] The ISO 14000 series provides guidelines for environmental management systems (ISO 14001), auditing guidelines (ISO 14010), labelling (ISO 14020), performance evaluations (ISO 14031), life-cycle assessment (ISO 14040) and product standards (ISO 14060) (Fryxell and Szeto, 2002; Chan, 2008; Nawrock and Parker, 2009; Hewitt and Robinson, 1998). A number of studies (Struebing, 2006; Hui *et al.*, 2000; Goodman, 1998; Pouliot, 1996) have shown that adoption of environmental management systems such as the ISO 14000 series and clean-production methods would not necessarily lead to a reduction in a firm's profitability.

of diverse types and specifications had obtained environmental labelling certification (State Council Information Office, 2006). In June 2007, the MEP (formerly SEPA) decided to suspend the construction of two projects (project for power generation from the incineration of waste in the Haidian district of Beijing, PX project in Xiamen) due to protests by local residents.

The Annual Report of Environmental Statistics 2008 published by the MEP offered a range of encouraging statistics on environmental enforcement. In 2008, the environmental authorities in China registered 95,000 cases of administrative sanctions for violation of environmental laws (90,000 cases treated), 178 prosecutions (149 implemented) and 4 criminal cases (2 treated). For the same year, 1,816 clean-production projects were approved, 167,000 discharge permits were allocated to qualifying companies, and 22,488 polluting enterprises were closed down. In addition, most of China's large and medium-sized enterprises have also set up environmental protection bodies responsible for their own anti-pollution work and the promotion of cleaner production. China is the world's leading provider of equipment for solar and wind energy.

In 2004, Chinese and international enterprises jointly created the China Business Council for Sustainable Development (CBCSD) to commit themselves to maintaining and promoting sustainable development. According to OECD (2008), *"in December 2007, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) issued the Guidance on Fulfilling Social Responsibilities for large state-owned enterprises (SOEs) under its supervision to: enhance awareness of social responsibility; establish a division responsible for social responsibility; publish a report regularly on social responsibility or sustainable development and conduct stakeholder consultations; and learn from foreign companies' best practices and experiences on social responsibilities"* (OECD, 2008).

Multinationals operating in China have exerted a significant influence on local enforcement capacity, either by using state-of-the-art waste management technologies in their enterprises or by insisting that their Chinese partners (or potential partners) adhere to a higher standard of environmental practice. For instance, Royal Dutch/Shell called on an outside environmental consulting firm and the United Nations Development Programme (UNDP) in order to conduct a social impact assessment during its negotiations with the China National Petroleum Corporation (CNPC) in view of completing a consortium agreement on the West-East Gas Pipeline Project (Day, 2005; Economy, 2005; Shell China, 2006).

Remarkably, by April 2011, more than 208 private and public firms^[28] (including CNOOC, Sinopec and PetroChina, a subsidiary of CNPC Group^[29]) had adhered to the United Nations Global Compact's ten principles in the areas of human rights, labour, the environment and anti-corruption.^[30]

Environmental NGOs in China have evolved from focusing on environmental education and biodiversity protection to debating a wide range of environmental issues, including large-scale infrastructure projects, lack of enforcement of environmental requirements, and misappropriation of funds by the administration (Wu, 2009). NGOs have likewise played an important role in legal support to the civil victims. According to the OECD (2006), *"the Centre for Legal Assistance to Pollution Victims (at the University of Politics and Law in Beijing) operates a telephone hotline about environmental legal issues and has taken more than 30 cases to court on behalf of pollution victims, winning about half"* (OECD, 2006). In Pingnan County (Fujian Province), villagers won their lawsuit against a large chemical plant with assistance from the Centre (OECD, 2006). NGOs have organised public education activities, media campaigns against pollution cases, and advocated alternative policy solutions (Yang, 2010).

[28] According to: <http://www.unglobalcompact.org/participants>, accessed 21 April 2011.

[29] As at the end of 2009, CNPC had an 86.285% stakeholding in PetroChina (source: PetroChina, 2009 Sustainability report).

[30] These principles are: *"Human rights 1. Businesses should support and respect the protection of internationally proclaimed human rights; 2. Make sure that they are not complicit in human rights abuses. Labour 3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; 4. Elimination of all forms of forced and compulsory labour; 5. Effective abolition of child labour; 6. Elimination of discrimination in respect of employment and occupation. Environment 7. Businesses should support a precautionary approach to environmental challenges; 8. Undertake initiatives to promote greater environmental responsibility; 9. Encourage the development and diffusion of environmentally friendly technologies. Anti-Corruption 10 Businesses should work against corruption in all its forms, including extortion and bribery."* Source: <http://www.unglobalcompact.org/aboutthegc/thetenprinciples/index.html>, accessed on 21 April 2011.

Photos 1 and 2 *Importance of the environmental challenge in China*

1 / Sorting encouraged in Shanghai (January 2009)



Photo Credit: Romain Dittgen.

2 / Street scenes (Beijing, May 2010)



Photo Credit: Géraud Magrin.

1.3.2. *The gap between regulation and implementation*

The nature and scale of the environmental problems facing China would represent a challenge for any minister of the environment. It is difficult to imagine what the state of China's environment would have been without the tremendous efforts already accomplished. Yet despite these efforts and achievements, the country's environmental issues remain colossal.

China's environmental situation is still a major issue, as demonstrated by the widespread air and water pollution and the continuous deterioration of natural resources. Since the 6th FYP, China has incorporated an environmental plan into its national social and economic development plans, but the environmental targets of the 6th FYP (1981-1985) through to the 10th FYP (2001-2005) were never fully achieved. According to the State Council's analysis, only six of the fourteen environmental targets listed were actually met in 2005. SO₂ emissions rose sharply by 27.8% compared to the 2000 level, while the main river basin regions of Huaihe, Haihe, Liaohe, Taihu, Chaohu and Dianchi achieved only 60% of pollution control targets. The emissions of major pollutants far exceed environmental capacity, producing serious environmental pollution (State Council, 2007). In 2008, China's energy consumption per unit of GDP was seven times higher than Japan's (World Bank, 2009). For the same year, China's GDP was around USD 4.3 trillion, less than 7% of total world GDP, but its consumption of energy, steel, coal and cement accounted respectively for 15%, 27%, 31% and 54% of the world total (World Bank, 2009). Environmental protection policies alone would not

suffice to change this high-input, low-output pattern of growth. Despite protection efforts, the pollution of large sections of China's river systems still exacerbates water scarcity (2030 Water Resource Group, 2009).^[31] Freshwater consumption was 2,156 m³ per capita in 2007 (among the lowest per capita for a major country) and 60% of China's 660 cities experienced water shortages. Moreover, water resources are unevenly distributed across the country: in 2000, southern China accounted for 80.4% of the nation's naturally available water resources but only 53.3% of the population, whereas northern China accounted for 19.6% of the water resources but 46.7% of the population (World Bank, 2009; OECD, 2007). Since a benzene spill by a chemical plant in 2005,^[32] the Chinese media have revealed many water pollution accidents. The price China pays for water pollution is very high: the World Health Organisation (WHO) recently estimated that 75% of all disease in China comes from water pollution, as illustrated by the numerous "cancer villages" along polluted water sources across the country. WHO estimates the number of Chinese deaths related to water at 100,000 a year.^[33]

Thirteen Chinese cities figured on a World Bank list of the twenty most polluted cities in the world in 2006 (World Bank, 2011). The main source of air pollution is energy production. In 2009, coal accounted for 77.3% of China's energy (State Statistics Bureau, 2010). The coal-fired power plants operate using out-dated technologies, which results in levels of air contamination by sulphur dioxide, nitrogen oxides, soot and dust that exceed Chinese standards. The dramatic surge in the number of individual cars and cement plants is another major contributor to air pollution and greenhouse gas emission. By 2010, China may overtake the US as the world's largest emitter of greenhouse gases.^[34] The consequence of sulphur dioxide emissions is acid rain: among 477 cities (counties) under monitoring, 252 suffered from acid rain. These cities are mainly concentrated in the region to the south of the Yangtze River and to the east in Sichuan and Yunnan, including Zhejiang, Fujian, and Jiangxi, most of Hunan and Chongqing as well as the Yangtze River delta and Pearl River delta (MEP, 2009).

[31] The MEP has a classification grid for different levels of water pollution: levels I-III mean that water is safe to drink, level IV that water is reserved for industrial use and level V that it is for irrigation purposes only.

[32] Following an explosion at a factory (government-owned Jilin Petrochemical, a subsidiary of PetroChina) in north-eastern China in November 2005, one hundred tonnes of benzene and nitrobenzene ran into the Songhua River, forming an 80km slick of heavily contaminated water that hit the city of Harbin and left four million people without public water services for five days.

[33] According to <http://www.pacificenvironment.org/article.php?id=1878>, accessed on 5 May 2011.

[34] A declaration from the International Energy Agency's chief economist, April 2007.

The economic cost of air pollution is estimated at 3.55% of annual gross national product (GNP) with damage to human health accounting for 69% of this cost.^[35] A WHO report estimates that diseases triggered by indoor and outdoor air pollution kill 656,000 persons each year (Liu, 2009). According to Chinese government statistics, 300,000 persons die each year due to ambient air pollution, mostly from heart disease and lung cancer. An additional 110,000 die from illnesses linked to indoor pollution due to poorly ventilated wood and coal stoves and toxic fumes from sub-standard construction material (CAEP, 2003). The air pollution death figure is expected to rise to 380,000 in 2010 and 550,000 in 2020 (DRC, 2004).

China has experienced massive deforestation, degradation of grassland and acceleration of biodiversity loss, despite a recent renewal of forest cover from 18% in 2003 to 20.4% in 2008. According to China's seventh National Forestry Resource Inventory, forest quality is still poor; arbour stocking volume per hectare is only 78% of the world average (State Forestry Administration, 2009). Forest expansion has come mainly from planted forests, which have a lower stocking volume (Petry and Zhang, 2009) and lower biodiversity levels than the scarce primary forests. By 2006, 1.74 million km² were affected by desertification and over 90% of natural grasslands were subject to degradation (State Council, 2007). The pace of desertification seems to have quickened in recent decades in the north-west of the country, from 1,560 km² a year in the 1970s to 3,436 km² at the end of the 1990s, and 13,300–20,000 km² annually in recent years (State Forestry Administration, 2005). China, one of the world's "mega biodiversity countries", is home to more than 30,000 vascular plant and 6,300 vertebrate species. This biodiversity, however, faces enormous threats (Lopez-Pujol *et al.* 2006). Some 15-20% of China's animal and plant species are currently endangered (CAS, 2007). In 2006, nearly 3,000 of the plants and animals featured in the global IUCN Red List of Threatened Species were found in China.^[36]

1.3.3. *The search for explanatory factors*

Factors associated with the players

In the process of implementation and enforcement of China's environmental laws and regulations, the State occupies the dominant position and its organisation and mode of functioning directly influences the behaviours of enterprises and NGOs.

[35] According to <http://factsanddetails.com/china.php?itemid=392&catid=10&subcatid=66>, accessed on 5 May 2011.

[36] According to the Conference of Parties to the Convention on Biological Diversity, Bonn, Germany 19-30 May 2008.

In 2008, there were 12,215 administrative institutions in charge of environmental protection, including 42 at national level, 351 at provincial level, 1,865 at municipal level, 8,432 at county level and 1,525 at township level, with a total of 184,000 staff employed in environmental administration, monitoring, inspection and control, statistics collection, scientific research, publicity and education (MEP, 2008). The involvement of such a large number of agencies in environmental management certainly reflects the increasing environmental awareness of the Chinese government. However, certain agencies have been created for purely material reasons (enhancing their image, access to additional financial resources from central government and external financing, etc.). This profusion of agencies has contributed to the inextricable complexity of environmental governance and produced administrative overlaps and high coordination costs.^[37]

Expectedly, the goals and priorities of these environmental agencies and other governmental departments often diverge.^[38] Both central and local governments prioritise economic growth over environmental protection since the performance of political leaders is mainly evaluated on the criteria of GDP growth, with little consideration given to environmental performance (Schwartz, 2000; OECD, 2008).^[39] At local levels, these conflicting interests are even more evident. The local EPBs not only report to the EPB immediately above them and ultimately to the MEP, but they are also subordinate to provincial and local governments. The latter are able to exert a sway over EPB activities, as it is they who control the EPBs' financial and human resources, whereas the MEP has only a limited technical influence. Should conflict arise, this dual supervision and their low-ranking status in the governmental hierarchy mean that EPBs often submit to the pressures of their local authority. It is not infrequent for local EPBs to enforce severe sanctions (high fines or a close-down order) against polluting enterprises, only to see local government intervene to mitigate or even cancel the sanctions on the pretext of protecting local employment and tax revenues (Wang *et al*, 2008; Economy, 2005). This local government bias towards economic growth has been reinforced by fiscal decentralisation policy as the 1994 fiscal reform has made the local governments' tax revenues increasingly dependent on local enterprises in their jurisdiction (Economy, 2005).

[37] cf. Barrouch, 1989, for a study on fragmented environmental regulation in France.

[38] cf. Chabason and Guignabel, 1995 for a review of the emergence of environmental agencies in France and their epic struggles with the Ministries of Transport and Energy, the agencies for infrastructure and the nuclear lobbies.

[39] In recent years, the State Council has chosen to set up an environmentally adjusted accounting system designed to reduce this bias towards GDP growth when evaluating government officials' performance. This will not however come into operation in the near future.

The multiplication of environmental authorities and a certain lack of rigour within the NPC's law-making processes lead to overlaps and inconsistencies between laws and regulations enacted by different government agencies (Gang, 2009). For example, the Water Resource Law stipulates that *"water resources include surface water and groundwater"* and *"are managed and supervised by the Water Authority of State Council"*. However, the Mineral Resource Law entrusts management of groundwater to the Mineral Authority of the State Council. Both these Laws require payment of fees for the exploitation of groundwater. The overlapping of environmental enforcement authorities and the lack of a coordinating body may thus lead to inconsistencies in the enforcement of environmental laws (Schwartz, 2000). They may also lead to lengthy law-making processes, as illustrated by the Law on the Prevention and Control of Air Pollution (Alford and Liebman, 2001). The first draft of the Law, prepared in 1987, was ambiguous and unenforceable. In the middle of the 1990s, SEPA almost abandoned the bill due to numerous objections from the State Plan Committee, the State Economic Committee, the Ministry of Coal, the Ministry of Electricity, the provincial governments of Sichuan and Gansu, and the automobile industry. It took thirteen years to see the final promulgation of this Law as a result of a long process of negotiation and consultation among all involved parties (Alford and Liebman, 2001; Economy, 2004).

As the enforcement system is headed by sectoral state departments, the implementation of environmental laws is less effective, especially since many of the agencies have not yet internalised environmental conservation (Qiao, 2005). In theory, the MEP and local EPBs are responsible for ensuring that other agencies enforce environmental legislation but the same enforcement powers have also been assigned to sectoral administrative departments (OECD, 2006). As long as the ministries perceive the environmental dimension of their activities as being at odds with *"the sector's interests"*, this department-led enforcement system will lead to a weakened application of environmental laws, as each governmental department has an incentive to enforce them less stringently (Qiao, 2005).

State-owned companies are embedded in the executive arm of government at national, regional and local level. The degree of autonomy of their management vis-à-vis the State or local authorities varies strongly according to the nature of their activity, their strategic value and the geographical scope of their operations (national or worldwide). Large state conglomerates naturally have more influence on policymaking than the smaller specialised state-owned firms, whatever their sector (industrial, commercial, public utilities). When a dialogue exists, the state agencies discuss policies with state-owned conglomerates and large state-owned companies, which then operate as both producers and consumers of policy signals. The interaction between these large enterprises and policy signals is somewhat paradoxical. In theory, the large

enterprises are easier to reach and to negotiate with, which would imply that, once an agreement has been made, the probability for enforcement should be high and the impact across large conglomerates huge. However, the embedded relationship with the executive branch may in fact hinder or delay enforcement, especially when contradictory policy signals are sent out by different ministries (for instance, growth *versus* protection). It is more difficult to reach and negotiate with the widely scattered smaller and micro private enterprises. These usually operate as consumers rather than as producers of policy signals. Although small and easily controllable, at least in theory, their number and geographical dispersion mean that they can always avoid, evade or obstruct policies. In all cases, the implementation of environmental regulation signals depends heavily on the enterprises' willingness to comply.

NGOs play an increasingly important role in environmental issues, even though their windows for action are still limited. All Chinese NGOs need to be registered and to obtain the government's approval, which involves meeting various strict requirements regarding a minimum number of members, financial autonomy, etc. (OECD, 2006; Economy, 2005). According to OECD (2006), *"NGOs still have limited ability to obtain information... Information on the environment is too often considered as confidential and thus only distributed to high-level government officials"* (OECD, 2006). Indeed, Article 21 of the Law on EIA (2002) foresees the possibility of restricting access to certain data, but what the legislator had intended as an exception has now become the rule for the executive authorities. These constraints limit the potential contribution of NGOs to environmental protection activities (OECD, 2006).

Rule-related factors

Despite the huge number of laws, regulations, standards and plans on environmental protection, China's environmental legislative system presents several drawbacks. With respect to the effectiveness of the EIA process, as the OECD (2006) points out, *"a total of 55,000 construction projects underwent the process in 2004, of which 1,190 projects were found to have failed to satisfy EIA requirements, including 30 big construction projects (most of them hydro or thermal power plants). A joint investigation by SEPA and the Ministry of Land and Resources showed that only 30 to 40% of the mining construction projects went through the required EIA procedures, and the share was as low as 6 to 7% in certain provinces"* (OECD, 2006, based on data provided by SEPA). Recent data have not been accessed.

Similarly, the "3S" procedures are not always strictly followed. According to the OECD (2006), *"there is evidence that sanctions associated with non-compliance of the 3S procedure are often not applied by local authorities... Industries usually fail to involve*

local environmental authorities early in the design phase of the project and ask for approval only when facilities are about to start operations” (OECD, 2006).^[40]

Despite the huge number of environmental laws and regulations both at central and local levels, some key environmental issues are not covered by the present legal framework. Some examples include: the prevention of soil pollution, sustainable management of chemical substances, comprehensive waste reduction and management, environmental permitting, damage compensation and liability for past pollutions (“environmental legacies”). The most serious vacuum in China’s environmental legal system is the lack of detailed implementing rules and enforcement procedures associated with specific environmental laws and regulations (Gang, 2009). For instance, the EPL (1989) sets the general rules for environmental protection but has no clear provisions for legal liabilities. Moreover, the Chinese laws relating to pollution (water, air, etc.) focus mainly on administrative liability, whilst civil and criminal liabilities are only vaguely defined. Moreover, this production of environmental laws and regulations puts enormous pressure on the country’s law-making capacities.

In China, most environmental laws and regulations are drafted in a broad and imprecise manner and ambiguities persist due to the fact that some major laws do not provide a precise definition of various key terms (Gang, 2009). For instance, the Law of Air Pollution Prevention and Control (2000) stipulates that *“State Council and People’s government at all levels must undertake measures to prevent air pollution, protect and improve atmosphere”* without, however, making any provision for the concrete measures and procedures to ensure that the various levels of government fulfil their environmental responsibility. These ambiguities open the door to different interpretations by different government departments and thus substantially increase the risk of non-compliance. As pointed out by Alford (2003), some Chinese environmental laws look more like policy statements and intentions rather than providing clear indications of what exactly is allowed and what is not.

Economic instruments are sophisticated and potentially effective governance tools but they require large amounts of historical data, modelling capacity and a fair knowledge of how the agents they govern behave. They also require a capacity to tune and then fine-tune an instrument. In ill-prepared organisational settings that do not provide

[40] According to OECD (2006), *“To overcome the implementation problems in some areas, a deposit-refund system for “3S” in construction projects has been introduced. Deposits, which are based on the project’s total investment cost, can be returned to investors upon approval of the project’s “3S” requirements. However, the deposit-refund system still has no adequate legal basis and no clear criteria for evaluation and return of the deposits”* (OECD, 2006)

these conditions, such instruments are likely to give rise to counter-productive results. This means that they are often poorly implemented by the local authorities. The pollution charges and fines are set too low to induce corporate compliance, despite recent increases.^[41] Firms often prefer to pay the charges rather than change their production processes to decrease emissions. In addition, the charge collection rate is low, estimated on average at less than 50% of the charges imposed (between 10% in western provinces and 80% in coastal areas (State Council Information Office, 2006). Chinese laws contain provisions for the maximal fines charged against polluters. In many cases, the upper limits are set too low relative to the amount invested in polluting projects and the environmental damages they cause. For instance, in 2005, thirty large construction projects (chiefly hydro or thermal power plants representing investments of over CNY 1 billion) failed to satisfy EIA requirements, while the highest fine charged by SEPA was no more than CNY 100,000, which has very little dissuasive effect on the violators. In the words of the OECD: *“In many cases, the actual charge paid by a firm is a result of bargaining between the administration and the firm... Some surveys show that state-owned enterprises pay lower effective rates than privately owned ones, and that the rates are positively related to firm profitability”* (OECD, 2006). In such conditions, the cost of operating these economic instruments may turn out to be higher than the results they deliver. Economic instruments might also distract from the real issues at stake. In what direction is this governance steering? What kinds of problems need to be steered?

Process-related factors

In China, environmental laws and regulations are drafted and promulgated by the National People’s Congress and various government departments, with the public or affected stakeholders playing only a minor role in this rule-making process. A large number of environmental laws and regulations are the result of a “consensus” reached during closed-door “negotiations and bargaining” between the government departments concerned and various interest groups. The lack of publicly available documentation on enforcement practices and procedures increases the uncertainty, unfairness and difficulty of seeking legal remedies in the area of environmental law enforcement (Ferris and Zhang, 2005). To improve the transparency of China’s legislative system, a recently introduced policy innovation is the publication of draft laws and regulations on government web sites for public comment. However, due to the limited human resources of the legislative authorities and to time constraints, public comments are poorly recorded and rarely receive feedback. Many Chinese

[41] The rates for SO₂ emissions were increased from CNY 0.21/kg to CNY 0.42/kg in 2004 and to CNY 0.63/kg in 2005; a new charge of CNY0.6/kg of NO_x was introduced in 2004 (State Council Information Office, 2006).

administrative agencies do not yet have a publicly available official gazette or other central publication for their administrative laws. Comprehensive, updated and accurate compilations of the legislation are not easily available (OECD, 2006). Local governments have substantial discretion in the interpretation and implementation of environmental laws. Inspectors work under the EPBs and are thus supervised by the local authorities, which may compromise the stringency of environmental enforcement (OECD, 2006).^[42]

This inventory of China's environmental problems and the solutions deployed invites us to shift from an analysis of what needs regulating to focus more on regulatory practice itself, especially now that the limits of environmental governance are making themselves felt (Benko *et al.*, 1995; van Vliet, 1997). Although many of the environmental issues could be characterised as "hard systems", some of the most persistent ones are not governable through classic command-and-control approaches or through technology alone. The recognition of "soft systems" and social responsiveness may make it necessary to design and test other management approaches based on dialogue and communication (Ackoff, 1974; Baumgartner, 1986; Checkland, 1984; van Vliet, 1997). The Chinese development path has produced a specific type of societal organisation that calls into question many governance approaches, including the way in which environmental issues are steered. The question then arises as to whether the very basic principles of cybernetic management (such as the one advocated by Conant and Ashby, 1970) are still useful or whether they are also challenged by the Chinese experience.^[43] The question of whether the State's approaches to regulation need to be adapted to the new societal configuration created by economic reform is at the heart of many debates in China.

An analysis of the factors affecting overall state environmental regulation provides a useful insight. But is this general overview valid for all sectors? The analysis of environmental regulation in the petroleum sector may guide us further in our investigation.

[42] To avoid this, some provinces and centrally administered municipalities such as Henan, Hubei, Beijing and Tianjing have set up inspectorates that are separate from the EPBs. In addition, in 2006, five regional "enforcement coordination centres" were set up to independently monitor and investigate environmental issues. The regional centres, which are expected to be under direct control of the Environment Ministry, will be operating in the cities of Nanjing (covering east China), Guangzhou (south), Xi'an (northwest), Chengdu (southwest) and Shenyang (northeast). The five centres will investigate serious pollution cases, help solve transregional environmental disputes and supervise law enforcement in national nature reserves, key scenic spots and forest parks (Ministry of Environmental Protection, 2008).

[43] In their often cited paper, Conant and Ashby (1970) had argued that *"every good regulator of a system must be a model of that system"*. Implementing this theorem means that the designers and operators of a regulatory systems are faced with difficult choices: should they modify the system to be regulated? Modify the regulating system? Modify the actual aim of regulation and redefine what makes good regulation? ...

1.4. Is the petroleum sector an exception with regard to national environmental enforcement?

1.4.1. Background

Driven by strong economic growth, China's energy demand increased steadily over the last decade (State Statistics Bureau, 2009a). In 2009, China's total energy consumption reached 2.146 billion tonnes of standard quality oil, ranking second behind the USA (2.382 billion tonnes).^[44] Coal is the main energy source, accounting for 70.4% of total energy consumption in 2009, followed by oil (17.9%), natural gas (3.9%) and all other energies (7.8%) (State Statistics Bureau, 2009a). Oil consumption in China has increased steadily since the beginning of the century, although there has been a recent slowdown due to the economic recession that began in 2008. Faced with a severe energy imbalance induced by skyrocketing demand and dwindling domestic supply, China has been a net oil importer since 1993 and, in 2009, was the world's third largest oil importer behind the USA and Japan, with imports totalling 203.8 million tonnes of crude (National Energy Administration, 2009). To satisfy the soaring energy demand, China has sought to expand and transform its energy production capacity, which is still dominated by coal (State Statistics Bureau, 2009b). In 2009, oil held second place in the energy production mix with a share of less than 10%, in sharp decline from 17% in 2000 (State Statistics Bureau, 2009b), which reflects the increasing constraints on the domestic supply of this resource. The dwindling domestic supply prompted two policy responses: a drastic re-organisation of the petroleum sector and the push to invest abroad (long before this became the government's official going-out policy, cf. Jiang and Sinton, 2011).

In the early 1980s, oil and gas production was under the direct control of a Petroleum Industry Ministry. Business operations were delegated to China National Offshore Oil Corporation (CNOOC) created in 1982 and China Petroleum and Chemical Corporation (Sinopec), created in 1983. In 1988, the Petroleum Industry Ministry was abolished and renamed as China National Petroleum Corporation (CNPC), responsible for upstream oilfield management and exploration, while Sinopec was in charge of downstream operations such as refining and commercialisation. From 1998, both CNPC and Sinopec were encouraged by the government to develop fully integrated industrial value chains, combining upstream and downstream operations.^[45] Consequently, in

[44] According to the website of the US Agency of Energy Information, accessed July 2010.

[45] Source: CNPC, the History of CNPC, http://www.cnpc.com.cn/english/gsgk/lsyds_cnpcls.htm, accessed 24 April 2011.

2004, with a view to fostering competition among the three state-owned companies and levelling the playing field, CNPC and Sinopec obtained the right to engage in offshore exploration and production, while CNOOC was granted the right to engage in onshore exploration and production (Guo, 2006). CNPC, Sinopec (in 1999) and CNOOC (in 2001) have thus become the Chinese oil majors. Today, Chinese oil companies are present in all of the world's oil-producing regions (Guo, 2006; Lee and Shalmon, 2007; Houser, 2008) and have been transformed into shareholding companies in which the State has a majority stake. According to Fortune magazine's 2010 business rankings, Sinopec and CNPC^[46] hold the seventh and tenth place in the list of the world's largest corporations; CNOOC is included in the list of 500 top corporations. In 2009, Sinopec was China's largest oil company in terms of total turnover (USD 187.5 billion) (Annual Chinese Oil Company Report, 2009), whilst CNPC was the most profitable with profits almost double those of Sinopec (Annual Chinese Oil Company Report, 2009) given that CNPC controls most of the oil and natural gas resources in China.

In order to ensure national energy security, the government encouraged national oil companies to set up oil production bases abroad. In 1992, CNPC's exploration project in the Canadian Alberta North Twing oilfield marked the beginning of the wave of overseas investments by Chinese oil companies. Since 1999, with strong backing from the official "going-out" policy, Chinese oil companies have massively increased their overseas investments to take control of oil and natural gas resources in Africa, the Middle East, Central Asia, Oceania, and North and South America. In 2009, China signed "loans-for-oil" cooperation agreements with a number of countries including Russia, Brazil, Ecuador, Kazakhstan, with a total contract value exceeding USD 40 billion. From January 2009 to April 2010, the three Chinese national oil companies spent a total of USD 29 billion on purchases of oil and natural gas resources around the world (EIA, 2009). In 2009, China's total oil imports reached 252 million tonnes, including 204 million tonnes of crude, up 13.4% on the previous year. The ratio of dependency on foreign oil increased from 51.4% in 2008 to 53.6% in 2009 (National Energy Administration, 2009). In order to reduce the dependency on Middle-East oil supply, China has diversified its overseas sources of oil and natural gas supply (with projects worldwide). China's increasing presence in Africa is an illustration of this intent. The oil production by the subsidiaries of the three companies operating in Africa now accounts for 30% of China's total oil import (State Statistics Bureau,

[46] According to the Top 500 ranking of the *Financial Times*, CNPC is the world's number one corporation in terms of asset value and staff.

2009b). By March 2010, African export of oil to China accounted for 13% of the continent's total oil exports, and China's investment accounted for 6% of the total foreign direct investment (FDI) received by Africa for this sector. As a result of this overseas expansion, China's overseas oil production has increased rapidly in recent years. In 2008, daily overseas production by Chinese oil companies was 900,000 barrels (around 45 million tonnes), accounting for 25% of China's total oil imports, 23% of domestic oil production and 12.5% of domestic oil consumption. In 2010, overseas oil production will reach 1,200,000 barrels per day (around 60 million tonnes) and, in 2020, will likely account for 50% of domestic consumption (FGEG, 2008).

1.4.2. *Potential environmental impacts of oil exploration, production, processing and transportation*

The petroleum industry integrates a whole chain of activities such as prospecting, extraction, transportation, refining and commercialisation. Each stage of the process, individually or cumulatively, can contribute to environmental impacts.

- Groundwater depletion and pollution: the depletion of groundwater may have far-reaching consequences. It contributes not only to subsidence threatening nearby buildings and constructions, but also to the drying-up of lakes and wetlands, which then leads to increasing soil salinity and desertification. This is particularly true in ecologically sensitive areas such as China's arid northern region. At the same time, groundwater may also be contaminated by poorly managed toxic pollutants produced by oil extraction activities. A toxic chemical leakage or an accidental oil spill may severely pollute the ecological system, leading to considerable economic damages to agriculture and fisheries (Dong and Hao, 2006).
- Pollution of surface water and soil: the exploration and production process may generate huge amounts of effluents (water and chemical mud) which could severely pollute the surface waters and soils around the exploration site. In 2005, total wastewater discharge produced by onshore oil companies in China amounted to 701.7 million tonnes per year, accounting for 2.1% of total industrial wastewater discharge (State Oceanic Administration, 2006).
- Air pollution: oil production may produce natural gas. If natural gas is not processed or re-injected, it is burnt and gas-flaring increases the levels of atmospheric SO₂ and CO₂. Frequent movements of trucks and light vehicles in and around sites also create dust. The evaporation of light oil products during storage or transportation will pollute the surrounding air. In 2005, the total emission of waste gases discharged by Chinese onshore oil industry was 471 billion m³,

accounting for 3.42% of total domestic waste gas emissions for that year. (State Oceanic Administration, 2006)

- Biodiversity loss: the construction and operation of oil facilities may destroy vegetation and disrupt wildlife habitats.
- Noise and solid waste pollution: the construction and operation of oil facilities produce noise levels that may disturb the daily life of local residents. Untreated solid waste may take up scarce land and pollute soils and groundwater reserves.

The more sensitive the ecosystem likely to be impacted, the higher the associated environmental and social risks. Some of China's onshore oilfields are located in the arid Gobi desert, which is an ecological hotspot and fragile ecosystem. Numerous oil facilities (including refineries and pipelines) are located close to agricultural land, rivers, lakes and aquaculture sites, while off-shore drilling sites are situated near sensitive marine reserves. There is thus a real risk that these impacts will occur. Indeed, some potential impacts have materialised in a recent series of accidents including the gas pipeline explosion in Kai County in Chong Qing municipality in 2003, the explosion of a petrochemical factory on the banks of the Songhua River in Jilin Province in 2005 and an oil spill in the Bohai Sea caused by the explosion of a maritime oil pipeline in Dalian City in 2010. These events helped to trigger the formulation of state environmental laws and regulations concerning the petroleum sector.

1.4.3. *Environmental regulation of the petroleum sector*

In China, the current environmental legislative regime for the petroleum sector is characterised by a combination of general laws and sector-specific regulations.

General environmental laws, regulations and decrees applicable to the petroleum sector

The petroleum sector is required to comply with all nationwide environmental laws and regulations, including the EPL (1989), as well as all relevant specific environmental laws and regulations and administrative decrees. Some of the general laws contain specific measures for the petroleum sector. The Energy Conservation Law stipulates that the Energy Conservation Department under the State Council is to decide on policy relating to energy-saving technologies for the oil-processing and coal-powered electricity sectors. The EIA Law requires all oil companies to establish an environmental impact assessment system for each construction project, and the Clean Production Promotion Law encourages them to adopt clean production technologies. The Regulation on the Environmental Management of Construction Projects establishes "3S" procedures for all oilfield constructions, while the Regulation on the Levy

and Management of Pollution Discharge Fees specifies the discharge fees for waste discharges from petroleum sector. The rules for implementing the Mineral Resource Law stipulate that extraction causing severe damages to mineral resources will be fined up to 50% of the total loss value. The State Council Regulation on the Levy and Management of Mineral Compensation Fees fixes the compensation fees at 1% of revenues from the sale of oil and natural gas.

Sector-specific environmental regulations

The environmental dimension of oil and gas operations is also ruled by sector-specific regulations. These are promulgated at national level by the State Council or its departments, or at local level by those provinces that are richly endowed with oil and gas.

The government has promulgated a series of administrative decrees to regulate sector-specific environmental issues. Two of these regulations^[47] establish the basic principles and rules for international cooperation in the exploitation of China's onshore and offshore oil resources and contain a provision for environmental protection. These two regulations represent milestones for environmental protection in the Chinese oil industry inasmuch as they formalise China's adhesion to "international practices" to protect environmental resources and prevent pollution and damage.^[48]

The Regulation on the Environmental Protection in Offshore Oil Exploration and Exploitation promulgated by the State Council in 1983 is an administrative decree entirely devoted to environmental issues in the petroleum sector. The Regulation defines the competent department in charge of petroleum-related environmental issues, the scope and the principles of the oil companies' environmental responsibility; it establishes emergency procedures in case of maritime pollution caused by the oil industry, and stipulates the administrative penalties and fines against violators and polluters.

Various departments within the State Council have also promulgated a series of administrative regulations concerning the petroleum sector, including the Circular

[47] The Regulation on the Exploitation of Offshore Petroleum Resources in Cooperation with Foreign Partners (promulgated in 1982 and revised in 2001 by the State Council) and the Regulation on the Exploitation of Onshore Petroleum Resources in Cooperation with Foreign Partners (promulgated in 1993 and revised in 2007 by the State Council).

[48] Article 22 in the two above mentioned regulations specifies: "In carrying out oil operations, the operator and contractor shall comply with the laws, regulations and standards of the State concerning environmental protection and safe operation, and shall follow international practices to protect agricultural land, aquatic resources, forest resources and other natural resources and prevent pollution and damage to the atmosphere, oceans, rivers, lakes, ground water and other land environment."

on the Reinforcement of the Protection of Oil and Natural Gas Pipelines promulgated by the State Economic and Trade Commission in 1999; the Guidelines on the Safety Evaluation of Onshore Oil and Natural Gas Extraction (2003); the Regulation on the Production Safety of Offshore Oil Production promulgated by the State Administration of Work Safety; the Circular on the Reinforcement of Environmental Management over Maritime Waste Discharges and Offshore Oil Prospecting and Exploration (1991) and the Circular on Several Environmental Protection Issues Relating to Offshore Oil Prospecting and Exploration (1993) issued by the State Oceanic Administration. The recent oil spill caused by the explosion of an oil pipeline in Dalian in July 2010 was followed by the new Law on the Protection of Oil and Natural Gas Pipelines, which came into force 1 October 2010. For the first time, this Law emphasises the responsibility of polluters to remedy environmental pollution caused by an oil leakage or oil spill.

These regulations and decrees have given rise to a series of detailed environmental technical standards covering oil prospecting, extraction, transportation, refining and commercialization (see Part Four for more details on standards in the Chinese petroleum sector).

At provincial level, governments in those provinces endowed with oil and gas resources have issued local regulations, such as the Rules of Environmental Protection Management in Onshore Oil Prospecting and Exploration in Hebei Province; the Regulation on the Environmental Protection in Oil Prospecting and Exploration in Liaoning Province; the Regulation on the Environmental Protection in Oil and Natural Gas Prospecting and Exploration in Heilongjiang Province and the Rules of Environmental Management in Oil Prospecting and Exploration in the Xinjiang Uygur Autonomous Region.

1.4.4. Enforcement of environmental regulations in China's petroleum sector

The general environmental laws are enforced by the environmental authorities at national and local levels, while the sector-specific regulations are mainly enforced by the competent departments.

Petroleum and the multiple bodies involved in environmental regulation

Several government agencies have regulatory jurisdiction over the domestic petroleum industry. Upstream oil and gas extraction licences are issued by the Ministry of Land and Resources. New refineries or chemicals factories of any significant size must be

approved by the energy and industry bureaus of the National Development and Reform Commission (NDRC) and are subject to the MEP's Environmental Impact Assessment. The NDRC's pricing bureau sets gasoline and diesel prices, and the Ministry of Finance levies a windfall profits tax on upstream oil extraction (and would administer a fuel consumption tax, if ever one is introduced) (Houser, 2008).

The government departments that oversee the enforcement of environmental laws and regulations in the petroleum sector vary according to the nature of environmental issue involved. The environmental authorities under the MEP and local environmental protection bureaus have the authority to supervise environmental management and to enforce the national environmental policies. More precisely, they have authority to establish national environment protection standards and sector-specific standards, to oversee the compulsory environmental impact assessment of oil and natural gas projects, to ensure compliance with the "3S" policy, to deliver discharge permits, to implement the discharge fee policy and to take administrative sanctions against violators (Yue and Mu, 2007).

The State Oceanic Administration and its local agencies are responsible for the supervision of offshore oil exploration and pollution control. When pollution caused by oil exploration, refining or transportation affects aquatic production, the State Fishery Administration and its local agencies intervene to deal with the pollution and fine the polluters. The use of radioactive substances in oil prospecting is monitored by the Ministries of Health or Public Security. The administrative departments for construction matters oversee the implementation of the "3S" policy, enforce environmental protection measures during the design and construction of oil projects, and monitor the operation of environmental protection facilities after the completion of the construction project. Finally, land resource departments and water conservancy departments may also intervene in the event that soil, groundwater or rivers are polluted by the oil industry (Yue and Mu, 2007).

Besides these administrative enforcement mechanisms, the government's new green policies such as green tax, green credit, green insurance and green securities also apply to the petroleum sector. For instance, in February 2008, the MEP and the China Insurance Regulatory Commission jointly issued a directive on Environmental Pollution Liability Insurance. The petroleum sector was selected among other polluting industries to serve as a pilot. Moreover, the green securities policy issued by the MEP in February 2008 requires the petroleum industry to carry out an environmental audit before any initial public offering or refinancing through the securities market (OECD, 2008). Finally, the oil companies are encouraged to adopt environment-friendly practices

and international environmental standards on a voluntary basis. Since the 1990s, Chinese oil companies have gradually adopted the ISO 14000 series of standards and established the Health, Safety and Environment (HSE) management system (cf. Part Four).

How effectively are state environmental regulations enforced in the petroleum sector?

As discussed above, despite the enormous efforts, overall environmental enforcement in China is compromised by diverse institutional, economic and political factors such as overlapping competencies or lack of coordination, the close relationship between the authorities and managers of public conglomerates, inconsistencies between general environmental rules and specific regulations, and inconsistencies between specific regulations. These factors also partly apply to China's petroleum sector.

Chinese oil companies are state-owned enterprises. They have a certain level of autonomy in their business operations, but are closely tied to the State Council and its departments. It took years for the public, and CNPC employees, to perceive the difference between the CNPC and the former Petroleum Industry Ministry, out of which it was created. The managers of large oil conglomerates enjoy very high hierarchical ranking (for instance, the CNPC president holds the rank of vice-minister). Moreover, the fast-evolving nature of the oil industry and its state-of-the-art technology require highly qualified and equipped environmental experts who understand the processes, ask the appropriate questions and are able to conduct the relevant tests and measurements. As in many Western countries, the MEP and the Ministry of Energy are not in a position to ensure independent and qualified environmental monitoring of the oil industry. There are no independent laboratories on which an independent monitoring system could be based. Although discharge fees or fines can be used to deter eventual polluters in the petroleum industry, these are set too low to encourage any compliance. The Regulation on the Environmental Protection in Offshore Oil Exploration and Exploitation even sets a maximum fine of CNY 100,000 for maritime pollution caused by an oil company, an amount which is negligible compared to the amount of the total investment made and the value of the damages to the environment and to surrounding economic activities.^[49]

Although the enforcement of environmental regulation in the oil industry presents many common points with what exists in other sectors, there are also striking differences.

[49] In the recent large-scale oil pollution accident in Bohai Sea (Dalian City), the State Oceanic Administration charged a fine of only CNY 300,000 against the involved company.

Specifics of environmental management in the petroleum sector

Several factors have helped to raise the petroleum sector's awareness of environmental issues, and this despite the stated preference of some authorities for economic growth rather than environmental protection. Environmental issues constitute a subject on which diverse viewpoints are tolerated. Environmental debates thus serve as channels for expressing many opinions to which the Chinese leadership is sensitive. On repeated occasions, the close ties between the oil industry and the Chinese political leadership have obliged the industry to react promptly to the complaints and outrage expressed by public opinion, affected residents, the authorities, party members and the media. Be it in a Chinese or Western company, accidents deeply affect the pride and careers of its engineers, and a company's reputation is a key factor in attracting the best young talents (young professionals, often aware of environmental issues, now have a choice in the extremely competitive labour market). The Chinese petroleum sector is one of the industries with the longest-standing tradition for self-regulation through industrial standard-setting, and the tightening of environmental measures has come about mostly at the companies' own initiatives. It is also the most heavily regulated industrial sector. As oil companies have to operate where the resources are located, they are used to multiple and repeated negotiations with a large diversity of actors in and around the industry. In recent years, the national oil companies have progressively increased their foreign investments, originally at their own initiative and later officially encouraged by the government's "going-out" policy. When venturing abroad, oil firms have had to adapt themselves to the prevailing regulations in the host countries in order to gain and maintain access to the international market and overseas investment opportunities. In the following chapters, we will attempt to gain a better understanding of these learning and adaptation processes.

1.5. Conclusion

In China, the demand for state environmental rules of the game has generally been met, spurred by a combination of internal and external factors (a surge in environmental degradation with the related economic and health costs, complaints from the public and party members, and the market constraints faced overseas as a result of the "going-out" policy). However, the key environmental indicators show that overall enforcement of government measures is still lagging.

The complex organisation of environmental regulation has some broad characteristics. At State Council level, the idea of combining harmonious development with the preservation of the environment remains difficult to put into practice in daily decision-

making. The MEP has yet to find its place among the better-resourced and more experienced ministries, which have not always taken on board the environmental dimension as a core concern for their decision-making criteria and procedures. The State plays a preponderant role in setting and implementing environmental rules; their regulation and implementation is mainly carried out by diverse state entities operating in a certain disorder. Frequently, the same entity not only issues the rule, but is also in charge of implementing, enforcing and monitoring it. Strong and independent oversight mechanisms are still few and far between. Non-state countervailing power mechanisms are still embryonic in the area of environmental regulation, which often relies on the participation of multiple stakeholders. Although national productive sectors enjoy a growing autonomy vis-à-vis the State, it still has very close-knit ties with the state administrations. Despite this, a growing adhesion to voluntary standards is playing an increasingly positive role in Chinese enterprises. The countervailing power of the small private sector and NGOs is as yet nascent and their role in the environmental governance model is still not clear. Official and unofficial media are providing more decisive checks and balances through their influence on public opinion, the Party and the functioning of the State.

Many of these broad issues are also affecting the Chinese petroleum sector. Confronted with a sharp rise in energy demand driven by strong economic growth over the last three decades, China's petroleum industry has expanded both domestically and internationally. This expansion has posed severe environmental challenges both in China and in the rest of the world. Nevertheless, in the Chinese petroleum industry, the gap between the increasingly complex environmental rules and their enforcement is narrowing. Firstly, because the oil sector is the industry with the longest-standing tradition of self-regulation in China. Although deeply embedded in the executive branch, the national oil companies have also to meet demands from multiple stakeholders (public or private partnerships, local communities, markets and even from company staff asking for better safety conditions). Thus, despite its traditional command-and-control approach to regulation, the Chinese petroleum industry, as a social laboratory, is paradoxically consolidating its experience in multi-stakeholder participation. This seems to be confirmed by CNPC's first steps in Sudan and Chad, two contexts that have strongly challenged the company's capacity to learn and adapt. Part 2 will look at how these challenges have been addressed.

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Part Two

2. The legacy of the Exxon-Doba project: petroleum-related environmental regulations in Chad prior to CNPC's arrival

Géraud MAGRIN, Gilbert MAOUNDONODJI and Antoine DOUDJIDINGAO

2.1. Introduction

Even prior to the arrival of CNPC, Chad was no stranger to environmental regulatory laws and petroleum development projects. In 2000, a watershed year, the Doba oil fields exploration project, undertaken by an Exxon-led consortium and supported by the World Bank, led to the country becoming the largest recipient of private investment in Africa. The Bank's involvement had a catalysing effect upon the country's legal and institutional regulatory framework for the environment. This framework was gradually established following the country's independence in 1960, but had been encountering numerous difficulties in its enforcement. Doba's legacy therefore forms a key element in the environmental landscape in which the Rônier oilfield project emerged.

The Doba project has given rise to a great deal of debate, attracting considerable media attention at the national and international level. Environmental issues form an important part of the discussions surrounding it. The Doba project stands out because of its particular location and context, and the identity of the various players involved. The project started in the mid-1990s at a time of great turmoil: for Africa during this turbulent period, which coincided with the end of the geopolitical gains of the Cold War,^[50] economic and political difficulties struck at the heart of structural adjustment

[50] This expression refers to the financial backing that African regimes received from one camp or the other in exchange for their allegiance.

programmes and the onset of democratisation, and provided a fertile ground for the escalation of all identity-related conflicts (Magrin, 2010). Over the preceding decade, liberal reforms relating to mining and petroleum codes were promoted by the World Bank, acting within the scope of structural adjustment programmes and with a view to attracting investments (Campbell, 2009). Exxon looked to the World Bank for support in undertaking the project, which was perceived as risky on account of Chad's long history of political instability since its independence. The World Bank in turn embraced the petroleum project as an opportunity to respond to its critics – the first ever petroleum project with the stated mission of poverty alleviation and sustainable development (Magrin, 2001; Donner, 2003) through the introduction of numerous measures that were entirely new for Africa. Construction of the infrastructure began in October and stretched over three years (Magrin 2003), with start-up of production in October 2003. In 2005-2006, the Chad government challenged certain provisions that it thought too constraining, thus triggering an open crisis with the Bank and the Bank's withdrawal from the project. From 2006 to 2008, the coalescence of internal factors and the spread of the Darfur crisis brought about a political and military crisis, and petroleum money was mainly used to procure weapons (Behrends, 2008; International Crisis Group – ICG, 2009). The doom-mongers were quick to claim victory, declaring that the Chadian model had failed miserably (Pegg, 2009).

In order to understand the history of the petroleum legacy that CNPC will have to deal with, it is essential to examine the environment-related regulatory changes that have occurred in Chad in recent decades, especially the manner in which the country's "rules of the game" have been framed and implemented in the wake of the Doba project. The project aimed to create an exemplary environmental programme and governance (Magrin, 2003; Maoundonodji, 2009). Have the Doba environmental regulations been slowly and steadily whittled down in the course of a decade (2000-2010), following the slump of the mining sector (van Vliet, 1998; Magrin and van Vliet, 2009), thereby substantiating the views of the proponents of the thesis that "natural resources are a curse" (Rosser, 2006)? Or on the contrary, can a change be discerned in the direction taken by the Chadian environmental regulatory system and will the Doba project's inherent strength produce a ripple effect on future projects, including the CNPC project (Capoccia and Kelemen, 2007; van Vliet and Magrin, 2009)?

The pessimistic approach subscribes to the "resource curse" thesis, whereby rents derived from natural resources inevitably produce many negative effects. Many authors consider that the resulting dysfunctions are likely to occur in the three areas: macroeconomy, governance and conflict (Rosser, 2006). And to these three we shall add the environment. The negative impact on the environment tends to worsen with

time. In fact, according to van Vliet (1998), environmental regulations weaken as the mining cycle advances: infrastructure ages and the company no longer has the incentive to take mitigating or corrective measures to counter its environmental impacts (it no longer needs to rely on acceptance by the local milieu as is the case at the start of the project; the investment has paid off, etc.).

However, huge petroleum projects such as the Doba project have been able to move away from the already laid-out path of the “curse”. New directions emerge at specific moments when the key players opt for choices with potentially durable consequences (Capoccia and Kelemen, 2007). The choice of a given option can open up a new path, until the next opportunity for bifurcation occurs (*ibid.*). Van Vliet *et al.*, (2009) have claimed that such changes in direction can be attributed to the contradictory demands for regulation made by the petroleum industry on the Mauritanian and Chadian government authorities and on other stakeholders.

We shall therefore attempt to examine the following hypotheses:

- The setting-up of the petroleum industry has hastened the establishment of an environmental regulatory framework in Chad.
- Tensions in the petroleum sector have not eased despite high levels of regulation.
- The withdrawal of the World Bank has not led to a break-down of the environmental regulatory system inherited from the Doba project.
- Despite the difficulties surrounding this “model project”, Doba constitutes an essential part of Chad’s collective experience and has left its mark on the CNPC project.

In this study, we have used all the literature available on the Doba project, from its inception (Magrin, 2001; Magrin, 2003; Petry and Bambe, 2005) through to more recent times (Maoundonodji, 2009; Pegg, 2009; Magrin, 2009; ICG, 2010). We have also consulted the monitoring reports of organisations such as the International Advisory Group (IAG) (see in particular IAG, 2009), the External Compliance Monitoring Group (ECMG) and GRAMPTC. Apart from these bibliographical sources, interviews were conducted by the research team in summer 2010 at N’Djamena and the petroleum site with the Exxon executives from the Health, Safety and Environment department,^[51] current and former officials of the *Comité Technique National de Suivi et de Contrôle* (CTNSC – the National Committee for Technical Environmental Monitoring

[51] In this case, Mr Théophile Pinabéï, Mr Essaïe Rockoulyo and Mr Moustapha Daoud.

and Supervision),^[52] members of Chadian civil society such as CPPN (*Commission Permanente Pétrole Nationale* – National Standing Committee on Oil) the CPPL (*Commission Permanente Pétrole Locale* – Local Standing Committee on Oil^[53]), GRAMPTC, BELACD Doba and Oxfam, as well as inhabitants of Béro and Ngala, which are villages located at the heart of the Doba project zone.

This chapter is divided into three parts that follow the chronology of environmental regulations in Chad and its first petroleum development project. We shall start with a brief presentation^[54] of environmental regulatory issues prior to the advent of the petroleum era, the slow institutional growth of this regulation and the difficulties that came in the way of its implementation. We shall then show the importance of environmental issues in the implementation of the Doba project (1996-2004), by presenting the main protagonists and their interests and analysing the project's exemplary measures and the improvements brought about by continuous, informed debate. Lastly, we shall examine the changes in environmental regulation since the dispute between the Chadian government and the World Bank (2005-2010), by analysing the consequences of the fall-out with the Bank over environmental regulation, Exxon's practices and their effects on the social situation in the oil project area, as well as the behaviour of various actors with regard to the development of the oil sector.

2.2. Issues and limitations of environmental regulations in Chad prior to the petroleum era

2.2.1. *Environmental crisis factors in the Sahel region*

The challenges of environmental regulation in Chad are indicative of a situation common to all the countries lying in the Sahel-Sudan region. This area comprises some of the poorest countries in the world. With a very high demographic growth, the vast majority of people live in rural areas despite the rapid growth of large urban hubs.^[55] Agriculture, animal husbandry and fishing, in variable proportions, constitute the livelihoods of the rural poor, who are dependent on the meager natural resources provided by a semi-arid climate. After two decades of drought (1970-1980),^[56] the effects of global warming pose a further threat to these resources.

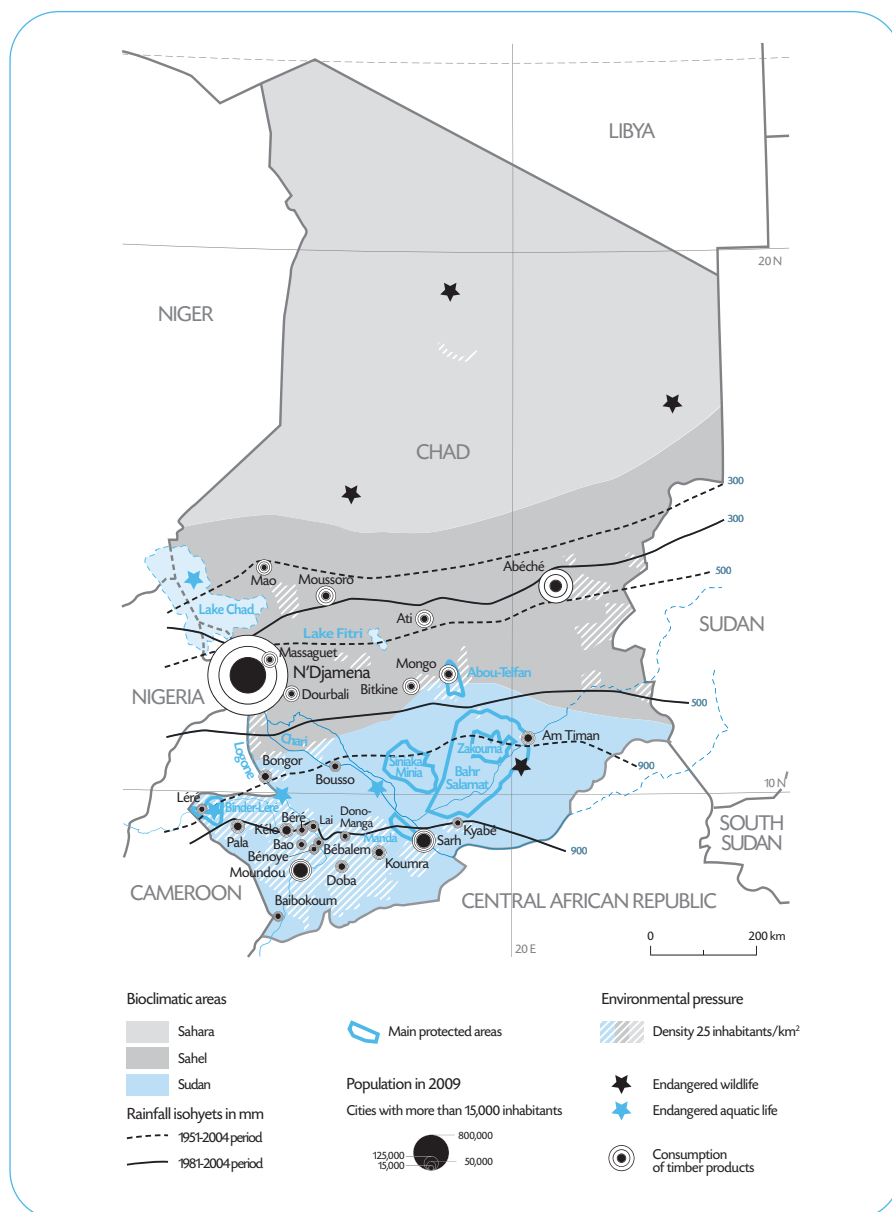
[52] Mr Mahamat Bechir, currently the executive secretary, and Mr Ismaël Moutar, who had been the site supervisor for many years.

[53] Based in Moundou.

[54] For further details, refer to Chapter 4 of the study that formed the basis of this book (Doudjidingao, 2010).

[55] According to the 2009 census, Chad's rate of urbanisation is 22%.

[56] Refer to Toupet, 1992 and Raynault, 1997.

Map 1 *Ecosystems and environmental tensions in Chad*


Source: © Geneviève Decroix, UMR 8586 PRODIG, CNRS.

Since 2000 onwards, the rural population has been exposed to increased rainfall variations and it is not currently possible to foresee any changes in rainfall patterns in the region over the coming years. This leads to specific problems that undermine the environment's productive potential, exacerbating tensions between communities and causing biodiversity erosion. Demographic growth and extensive-farming practices (sustained by the crisis in state agricultural assistance programmes^[57]) have led to forest clearances and a decline in forest cover. Increased pressure on resources (hunting, fishing, animal husbandry and agriculture) has depleted wildlife and fish stocks. The on-going desertification (i.e. degradation of land into arid zones due to unsustainable agricultural practices) affects both the land (erosion, salt accumulation in soil, loss in fertility) and the vegetation (depletion in quantitative and qualitative terms). Moreover, the urban explosion in a context of poverty worsens environmental problems: forest trees are hacked down by charcoal burners as timber is the primary source of energy while wastewater management and disposal in sprawling, new urban areas is problematic. In general, pressure on resources gives rise to tensions between different activities and groups, and these tensions are likely to degenerate into conflicts. For instance, irrigated agriculture practiced in the large valleys is at odds with the receding flood farming systems or animal husbandry practices (cf. Raison and Magrin, 2009). Thus, earlier environmental regulations were aimed at protecting natural resources under pressure, as there were no major industrial stakes at the time.

2.2.2. *Gradual establishment of a regulatory framework in response to regional crises and international practices*

Regional crises and growing international concern for environmental issues has led to the gradual development of the Chadian legal and institutional systems for environmental management. Chad is one of the "cradles" of environmental awareness and provided the setting for the first great ecological novel, *Les racines du ciel*.^[58] In the 1960s, however, the need for economic development overshadowed environmental concerns. Continuing the systems set up in the colonial era, the early laws focused on the creation of public land, through Laws Nos. 23, 24 and 25 of 22 July 1967, which were respectively entitled "Status of State lands", "Land ownership and customary land ownership

[57] The Government has largely abandoned rural areas since the structural adjustment programme of the 1980s (end of subsidies, decrease of technical support), with the result that extensive farming remains the most suitable option for farmers to deal with climatic and economic risks.

[58] "*Les racines du ciel*" (translated in English as "*The Roots of Heaven*"), a novel by Romain Gary (awarded the Prix Goncourt in 1956), describes the quest to save elephants undertaken by a slightly unconventional Frenchman living in south-eastern Chad, fighting against poachers and the indifference of the colonial authorities (more concerned by other priorities). The country's independence struggle provides the novel's background.

regime” and “Restriction of land rights”. The rules for implementing these laws have explicit environmental implications, such as Decree No. 14/63 of 28 March 1963 regulating hunting and ensuring wildlife protection and the maintenance of natural parks and reserves.

The droughts that struck in the 1970s and 1980s provided the necessary impetus for action. Chad joined the *Comité inter-États de lutte contre la sécheresse au Sahel* (CILSS – Permanent Interstate Committee for Drought Control in the Sahel). The Chadian government reaffirmed its commitment to promulgate laws and create the necessary institutions, ensuring economic planning along with environmental protection, by issuing a manifesto on 14 August 1976. In 1989, a Master Plan to combat desertification (Smake, 1994) was adopted, serving as an international framework for the optimal and ecologically rational utilisation of natural resources.

The emergence of environmental protection as an issue of international interest, as evidenced at the Earth Summit held at Rio in 1992, consolidated ecological awareness and the importance of these issues in Chadian institutions. An Environmental Ministry and a National High Committee on the Environment were established in Chad three months after the conclusion of the summit. The 1993 Sovereign National Conference proposed the setting up of an institutional framework for environmental protection. Article 48 of the 1996 Constitution, Chad’s supreme body of law, lays special emphasis on environmental protection. A National Agency for implementation of the environmental policy was also set up.

The law defining the general principles of environmental protection (Law No. 014/PR/98 of 17 August 1998) forms part of this process. The adoption of this law was likely hastened by more concrete prospects of oil exploitation. The law was supplemented by a Water Code in 1999. The process of issuing decrees for the implementation of Law No. 14 slowed down in the following years, as only two decrees relating to petroleum matters were published in 2010.

At the same time, Chad became a member of various international conventions dedicated to environmental issues: the African Convention on the Conservation of Nature and Natural Resources (1968), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973), the Ramsar Convention on Wetland Areas (1975), the Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS), the Convention for the Protection of the Ozone Layer, various conventions on the control of hazardous wastes, the Convention on Biological Diversity (1992), the Climate Change Convention (1992), the Convention to Combat Desertification (1994), etc.

2.2.3. *Difficulties in implementing regulations compounded by Chad's instability*

As is the case of all other countries in the Sahel region, enforcing environmental regulations is difficult; in the case of Chad, the problems are further compounded by specific factors linked to the country's troubled history.

Since the beginning of the twentieth century, in almost all African countries in the Sudan-Sahel region, the enforcement of environmental regulation has been torn between two frames of reference, two sources of legitimacy: customary laws and the legislation of a modern State. Customary laws define the relationship of the local population to its livelihood resources (land, water, vegetation and animals); they are based on the initial agreement between the first inhabitants and the local chthonic forces which granted them customary rights (but never exclusive individual property rights) and the power to grant similar rights to other newcomers. However, the enforcement of these laws was weakened due to the downgrading of the political institutions which upheld them and the demographic movement of populations towards resource-rich areas. In destination areas, various migrant groups, all competing for access to resources, turned towards different customary laws that were seldom compatible. The absence of a referral authority acceptable to all led to the use of force as a means of conflict resolution. The laws adopted by the modern State, during the colonial period and after independence, are at odds with customary laws, which they seek to replace.^[59] From the very start, administrative measures for environmental protection (regulations controlling hunting and cutting down of vegetation, creation of protected areas, etc.) were perceived by rural inhabitants as decisions taken by an unknown and far-removed authority, hence barely legitimate.

The difficulty of enforcing modern environmental regulations also stemmed from the means used, which further weakened the legitimacy of the rules in the eyes of rural populations. The colonial-era policy of environmental coercion, which was also pursued by the newly independent States throughout the 1960s and 1970s, was as much a legacy of the French paramilitary Water and Forest administration as a result of insufficient supervisory manpower. In the 1980s and 1990s, the structural adjustment programmes curbed the States' regulatory capacities. Thereafter, widespread corruption also undermined the effective implementation of environmental measures (Blundo and Olivier de Sardan, 2001).

[59] Customary laws sometimes also focus on specific issues, such as land. Everywhere, land ownership lies with the State, which has an eminent right over land. Only urban areas and some other zones and private properties have to be registered. Land access and management in the rest of the country remains governed by customary law.

Lastly, in most countries in the Sahel-Sudan region, decentralisation has transferred authority to local elected bodies, responsible for managing natural resources. This reform has led to an increase in the number of actors involved in environmental regulation. Moreover, environmental regulation, whether in terms of the framing of laws or their enforcement, has been further complicated due to the uncertainty surrounding the roles assigned to “traditional” authorities, *i.e.* local elects at different levels in local authorities and decentralised government departments. The decentralisation process is provided for by Chad’s 1996 Constitution; however, the country’s successive periods of political turmoil as well as the government’s ever-changing political priorities have delayed the process.

In Chad as elsewhere, environmental regulation has to contend with overlapping laws emanating from various authorities and overlapping interventions by those in charge of their enforcement. The government’s weakness thus undermines its role as a legitimate arbitrator.

Moreover, the government is vulnerable to the erratic policies pursued by international funding agencies. In view of the structural adjustment programmes and the heightened international interest in environmental issues, Chad’s environmental regulation programme is closely dependent upon aid and assistance schemes funded by external funding agencies. The main funding agencies have been the European Union and the World Bank – the former financed a Regional Gas Programme in the 1980s while the World Bank supported the creation of a National Domestic Energy Strategy in the 1990s and 2000s. These programmes were plagued by various problems, partly attributable to the usual limits of aid programmes (duration of projects, changing priorities, lack of harmonisation between funding agencies, etc.) and partly due to the specific local conditions in Chad.

The conditions specific to Chad are related to the country’s history, which is marked by several armed struggles. Whenever conflicts erupt, there is a slackening in the enforcement of regulations: weapons and soldiers abound, national parks turn into traps for wildlife (which becomes easy prey for poachers), massive population displacement and the influx of refugees put pressure on resources (especially plant resources), as was the case recently during the Eastern Chad and Darfur crisis (Bégin-Favre, 2008). This troubled history is marked by acts of corruption, coercion and violence perpetrated by government officials on rural populations. This not only leads to an escalation of sectarian tensions, but also a situation where groups that feel close to power openly disregard laws (customary or modern state laws) in order to gain access to land or pastoral resources, especially in the southern (Magrin, 2001) and eastern

regions (Bégin-Favre, 2008). Lastly, the slow decentralisation process in Chad has not made it possible to test – as in other Sahelian countries – the support mechanisms in place for decentralised management of the territory and its resources.

In conclusion, out of the three forms of environmental regulation – command (creation of protected areas), control (monitoring of villagers by Water and Forest authorities) and communication (participatory and decentralised natural resources management) – Chad has mainly experienced the first two. This situation can largely be attributed to the heavy burden of a coercive colonial legacy, marked by post-colonial violence. Even before the advent of the petroleum era, the complexity of environmental challenges was already proving too much for regulatory mechanisms. The juxtaposing of “modern” environmental regulatory systems with “customary” systems left a void which became a dumping ground for unresolved issues. Pressure on resources, the weakness of the government and armed conflicts further worsened the situation.

2.3. The environment in the implementation of a “model project” (1996-2004)

2.3.1. *Implementation of the project: expectations and involvement of actors*

The long-thwarted history of Chad’s oil industry and the players involved partly explain the importance of the Doba project in popular imagination and the expectations it aroused. They have been the backcloth for environmental regulation of the oil sector over the past fifteen years.

Oil exploration started in Chad in the 1950s. The first significant discoveries were made in 1973 by the American company, CONOCO, in the Doba Basin but the country’s repeated political upheavals put a brake on any exploitation of its oil deposits. The fall of President Tombalbaye in 1975, the civil war from 1979 to 1982 and the overthrow of Hissein Habré by Idriss Déby in 1990 prevented successive, and mainly American, consortiums from benefiting from the discovery (Maoundonodji, 2009:243-250).

Oil and the dreams of wealth it inspired thus found a singular echo in the collective imagination of the Chadian people at the time the World Bank-supported project was taking shape. In fact, the popular imaginary of development as embodied by this international institution became intertwined with the imaginary surrounding oil and Exxon (the key resource of the twentieth century’s global economic system, exploited by the world’s leading company and cornerstone of American superpower).

Expectations soared after thirty long years of waiting followed by three years of site construction and an announced thirty-year production period.

The project thus owes its originality to the Bank's involvement and the resulting interplay of its various actors. After the initial meetings in 1993, Exxon put forward a request for co-financing to the Bank in 1994. It was acting on behalf of a consortium then comprising Exxon, Shell (40% each) and Elf (20%) (Maoundonodji, 2009:255). From 1996 to 2000, when the project was taking shape, a debate arose between its promoters and its detractors (Magrin, 2001; Magrin, 2003; Petry and Bамbe, 2005).

The project involved developing 300 oil wells^[60] in the savannahs of Chad's southern region, near Doba,^[61] with production (225,000 barrels per day maximum) to be exported for thirty years through a 1,070 km pipeline stretching to Kribi on the Cameroon coast.

Although the project's main proponents foregrounded its exemplary nature, they were in fact pursuing different and potentially contradictory objectives. Thus, the Chad government presented the petroleum era to its citizens as a way out of poverty and destitution; oil represented a unique opportunity for this poor country to benefit from substantial resources, and could possibly even enable the government to recover its autonomy and escape dependency on structural adjustment programmes.

For the World Bank, the project offered the opportunity to improve its image following the backlash it had faced over the disappointing results of the structural adjustment programmes. It was thus willing to take a gamble: use a petroleum development project in one of the world's poorest and most unstable countries to further the goals of fighting poverty and promoting sustainable development. By implementing the appropriate support measures and setting up a favourable regulatory framework (macroeconomic and environmental), the Chadian State could be redeemed despite itself.

For Exxon, it was not simply a matter of economic profitability or the prospect of consolidating and diversifying its position in the Gulf of Guinea. The project also provided a learning experience in a difficult geopolitical context,^[62] – the project

[60] The use of a base located in Komé led to a heated debate. It housed various facilities – a detailed description is given in the EIA (refer, for instance, to Exxon 1999a).

[61] The Komé, Miandoum and Bolobo fields are actually located 30 kilometres or so to the south-west of Doba city, the administrative capital of Eastern Logone. The project is often referred to by the name of the closest regional capital.

[62] Exxon is the main operator in Equatorial Guinea; oil production soared at the end of the 1990s.

provided a learning experience in the midst of a difficult geopolitical situation,^[63] all more interesting as it was being run under the “umbrella” of the World Bank. The Bank’s participation was not in fact crucial from a financial viewpoint since its loans amounted to less than 10% of the project’s cost; more importantly, it guaranteed the investment by mediating between the operator and a Chadian socio-political system viewed as unpredictable.^[64]

The main opponents to the Chad petroleum project were mainly from civil society. International organisations were quick to warn against the dangers of repeating the Nigeria crisis, presented as the absolute anti-model. The Niger Delta stood as the archetype of the “resource curse”: at the local level, the fact that the local population did not benefit from any of the activities in the area and that their environmental resource bases were destroyed by diverse forms of pollution had led to extreme violence, so much so that the situation had become ungovernable. (see, for example, Watts, 2004). The profiles of the protagonists in the Chadian debate (NGOs such as Friends of the Earth, Greenpeace, etc.) played a major role in focusing the debates on environmental risks. On the other hand, Chad’s civil society mainly highlighted the political and governance aspects, denouncing the risks of strengthening a dictatorial and corrupt regime.

The World Bank’s presence made the debate even more heated: by acting as an indispensable guarantor for Exxon and by virtue of its position as a major player in development policies in Africa and elsewhere – the 1990s being a high point – the Bank was a “red flag” for international civil society. The oil-related context seems to have exacerbated relations of aid-based dependency, in which the asymmetry of the relationship does not prevent the dominated party from having some degree of autonomy or actively pursuing outward-looking strategies (Bayart, 2006). The World Bank’s commitment in June 2000 gave the signal for the implementation of the project.

[63] Up to the mid-1990s, Exxon had not undertaken this type of project (in Least Developed Countries in conflict). Its projects were mainly in the United States, the Middle East and offshore oilfields.

[64] The Bank loaned the necessary amounts to the Chad and Cameroon governments so that they could become shareholders in the companies operating the oil pipeline, Chad Oil Transportation Company (TOTCO) and Cameroon Oil Transportation Company (COTCO).

2.3.2. Clearer ground rules at the national level

Oil project timelines and the fact that the project was spurred on by the World Bank impelled Chad to modernise and clarify the regime of national environmental regulation. Two main changes involved the adoption of a general law stipulating environmental protection principles, on the one hand, and the updating of the petroleum code, on the other.

Petroleum activities and the 1998 Environmental Protection Law

The adoption of a law defining the general environmental protection principles (Law No.014/PR/98 dated 17 August 1998) helped pave the way for Chad's entry into the petroleum era.

The main purpose of this August 1998 Law is to *"lay down the principles for the sustainable management of the environment and its protection against all forms of degradation so as to safeguard and develop natural resources and improve the living conditions of the people"*. The law incorporates a version of a provision in the national Constitution that acknowledges everyone's *"right to a safe environment"* (Art. 47). Hence, several constitutional provisions (Art. 48 to 52) make it obligatory for the State, decentralised local authorities and citizens to protect the environment. The entire gamut of measures recommended is rooted in three fundamental principles: *"the polluter pays"*, *"prevention"* and *"precaution"*.

The measures inspired by the principle of prevention primarily involve the prior authorisation system, particularly prior authorisations or declarations of activities (Art. 45, 46 and 72, Law No.14/98).^[65] To strengthen these measures, lists of hazardous substances (Art. 69, Law No.14/98) and lists of animal or plant species requiring special protection were drawn up (Art. 25, Law No.14/98). Two essential aspects of prevention concern the obligation for operating companies to undertake EIAs at their cost before authorisation is granted (Art. 80; Law No.14/98) and to prepare contingency plans (emergency and intervention plans). The EIA contents have to include at least (i) a precise description of the project, (ii) its objectives and justifications, (iii) justifications for the choice of the site, (iv) the description of its initial state with existing environmental data, (v) the identification and assessment of possible impacts and, finally, (vi) emergency measures to be implemented in case of an accident and the recommended compensations recommended (Art. 84, Law No.14/98).

[65] For details, see Maoundonodji (2010).

The curative measures, which drew inspiration from the “polluter pays” principle, seek to correct and/or contain damage to the environment. Consequently, *“without prejudice to the application of criminal sanctions...^[66] the authorities responsible for the environment may require the restoration of the environment wherever possible from any perpetrator of an offence resulting in its degradation”* (Art. 101, Law No.14/98). In the same way, the environment’s restoration is charged to any operator *“practicing an activity that may lead to the degradation of the environment, even if it is not the result of a violation of the stipulations in the present law and its application texts”* (Art. 101, Law No.14/98).

Furthermore, incentives are also offered. For example, the law recommends environmental education, initial and continuing training *“at all levels so as to give rise to responsible behavior as far as the environment at the service of sustainable development is concerned”* (Art. 9, Law No.14/98).

The provisions of the 1998 Law No.14 have been extended by an entire gamut of other texts that also govern the petroleum sector. Consequently, Law No.011/PR/95 of 25 July 1995 on the “mining code” includes environmental provisions some of which are applicable to petroleum companies. The law specifies that the holder of a mining rights or the beneficiary of an authorisation by virtue of the mining code must use techniques that allow for the effective protection and management of the environment (Art. 66, para. 1 and 2, Law No.11/95). The opening up of quarries and the extraction of material for the construction of petroleum infrastructure clearly enters into its scope of application. This is also true for Law No.14-60 of 2 November 1960, which seeks to protect monuments and archeological sites, Law No.014/PR/95 of 13 July 1995 pertaining to the “Protection of Plants”, Law No.016/PR/99 of 18 August 1999 on the “Water Code” and Law No.014/PR/2008 on the “Forest, Fauna and Halieutic Resources Regime”. These different laws are supplemented by implementing texts. Chad is also party to regional and international legal instruments mentioned above, pertaining to environmental protection, which supplement national environmental laws.^[67] Although they are not all formally incorporated in the legal system, they complement or strengthen the national legislation applicable to the petroleum industry in the environmental sphere.

[66] Although dating back to the early independence years, the 9 June 1967 Criminal Code punishes damage to the environment. It stipulates that *“whosoever deliberately pollutes aquatic environments by pouring toxic products likely to destroy fish or other animals or facilitate their capture shall be punished”* (Art. 346, Law No.14/98).

[67] For more information, see Maoundonodji (2010) and the summary of environmental regulatory texts in Chad, given in the annex of the study coordinated by van Vliet and Magrin (2010).

Finally, an examination of the law defining the general environmental protection principles has shown that a number of implementing texts (about twenty) are required to make the legal arsenal operational. More than ten years after this law's adoption and promulgation, only two implementing decrees have been published. The first has to do with the regulation of environmental degradation and pollution (Decree No.904 of 6 August 2009), while the second pertains to EIA regulation (Decree No.630 of 4 August 2010). They were published after the implementation of the Doba project, but also after the signing of agreements between the Chadian government and the China National Petroleum Corporation International (CNPCIC) for the Rônier project (see Part 4).

The slow maturing of the Petroleum Code

The Petroleum Code also underwent major modifications in two stages that correspond to the advancement of the two petroleum projects successively implemented in Chad (Doba-Exxon in 1997, Rônier-CNPCIC in 2007).

In Chad, over a period of four decades, it was Ordinance No.7/PC-TP-MH of 3 February 1962 that regulated hydrocarbon exploration, production and pipeline transportation, thereby establishing the tax regime for such activities. The ordinance, with its implementing decree of 10 May 1967, constitutes the Petroleum Code. Within the framework of the Doba project, the Consortium managed to have this Petroleum Code modified through Law No.04/PR/97 of 23 July 1997. The different exploitation and production permits and the first agreements signed with petroleum companies nonetheless continued to be governed by the 1967 Petroleum Code. These were the 1988 and 2004 agreements on hydrocarbon exploration, production and pipeline transportation concluded with the Consortium (Exxon, Chevron and Petronas), as well as the 1999 agreement with the Cliveden Petroleum Ltd Consortium and the OPIC/Africa and Republic of Chad Consortium, taken over by CNPCIC in 2006-2007.

In February 2007, Law No.006/PR/07 pertaining to hydrocarbons repealed the 1962 Ordinance and made significant innovations. The main purpose of the new law was to define the legal and fiscal system for the prospecting, exploration, production, pipeline transportation, hydrocarbon processing, marketing, storage, refining and distribution of petroleum products, as well as the works and installations needed to undertake all these activities on the territory of the Republic of Chad. New environmental rules were also defined.

Thus, it was made mandatory for any petroleum contract holder to protect the environment in accordance with the precautionary method (Art. 10, 21) during all petroleum cycle phases.

During the prospecting phase, the permit holder must send an EIA, as defined in the present law and in accordance with the legislation in force in Chad (Art. 26.4, Law No.06/07), within six months of obtaining the said permit for approval to the Ministry of Hydrocarbons and the Ministry of Environment. If the contracting party does not comply with the terms of the present law, the Ministry of Hydrocarbons may withdraw its permit (Art. 28.1, Law No.06/07).

When exploration is conclusive, *i.e.* an oilfield that has been discovered can be commercially exploited and the permit holder wishes to move on to the production phase, the application for a production permit must be supported by a detailed development plan, including, in particular, an EIA along with an Environment Management Plan (EMP) and emergency plans as defined by Law No.014/PR/98 of 17 August 1998, as well as possible mitigation, compensation and re-installation measures, and a prior approval from the Ministry of Environment (Art. 29.4, Law No.06/07). The production permit may be renewed for an additional duration of ten years, provided that the contracting party fulfils all its obligations – particularly financial, technical and environmental – in accordance with the present law, the petroleum contract and the Chadian legislation in force (Art. 31.2, Law No.06/07).

In addition, the authorisation for related pipeline transportation and construction is subject to obtaining an agreement from the Ministry of Environment and the Ministry of Petroleum. The application for a construction permit must include the EIA, the EMP and emergency plans, among other items. Consequently, the permit holder must comply with environmental laws, in line with the precautionary principle, so as to prevent the risks and dangers associated with hydrocarbon spillage (Art. 32.3, Law No.06/07). Although the pipeline operator may have to allow for the transportation of a third party's production, authorisation requires compliance by compliance by such third parties with the usual environmental and socio-economic conditions (Art 34.1, Law No.06/07). These provisions are especially significant since they concern the prospect of a connection between CNPCIC wells and the Chad-Cameroon oil pipeline (see Part 4).

The environmental protection requirements are an integral part of the contracting party's and its sub-contractors' obligations. The operator must repair, at its own costs, any damage to the wells, property or environment caused while carrying out its petroleum activities (Art. 52.2, Law No.06/07). In the absence of applicable specific regulations, it has to act at all times in accordance with the precautionary principle and criteria of sound practices recognised in the petroleum industry (Art. 52.3, Law No.06/07). It is bound to restore upturned surfaces or abandoned production sites

to their original state so that there is no short- or long-term adverse effect on the safety of third parties, the environment and resources (Art. 52.4, Law No.06/07).

Consequently, Chad's legislative and regulatory framework for environmental protection was gradually clarified during the first phase of its petroleum adventure, from the period preceding the implementation of the Doba project (late 1990s) until the years following the World Bank's withdrawal (2008-2010). The regulations and institutions set up alongside the Doba project and, even more importantly, the people who were trained and the discussions held undoubtedly contributed to this overall evolution.

2.3.3. *The arrangements put in place by the World Bank*

The exemplary nature of the Doba project lies in the regulatory framework set up under the aegis of the World Bank and applicable to all areas of governance and environment (which will be our focus here^[68]). The conditionalities included in the 1999 loan agreement between the World Bank and Chad underline two main aspects: governance and the environment (Maoundonodji, 2009:255), which were to be accompanied by different measures. For governance, the flagship measure was the 1999 Petroleum Revenue Management Law (Law No. 001/PR/99), which sets the framework for the utilisation of oil rents using a pre-defined distribution mechanism benefitting poverty elimination priorities. It has been abundantly described and commented upon in the literature (Massuyeau and Dorbeau-Falchier, 2005; Maoundonodji, 2009:291).

In the area of the environment, the World Bank required the Chadian Parliament to vote in a law tailored to the new context as a precondition for its intervention – Law No.14/PR/98 of 17 August 1998 on general environmental protection principles. However, this law was little more than a first step towards setting up a modernised legal framework, firstly because was incomplete (for instance, no provision was made for accidental spillage of hydrocarbons^[69]) and also because the related implementing decrees were only published as of 2009. Thus, the loan agreement that endorsed the World Bank's investment provided a number of additional measures in the environmental field.

The 29 March 2001 loan agreement between the International Bank for Reconstruction and Development (IBRD), on behalf of the World Bank Group, and the Republic of Chad clearly specifies the norms and standards applicable to the project (see Maoundonodji,

[68] We have limited our references to the mechanism set up in Chad, as the situation in Cameroon has hardly any influence on the Rônier project.

[69] Interview with Alyom Djerambete, former Director of the *Fonds d'action concerté d'initiatives locales* (FACIL – Local Initiatives Social Fund).

2009:288; and Maoundonodji, 2010): the technical norms are those applicable to US industry;^[70] the standards related to the environment, human rights, resettlement and cultural heritage are those of the World Bank Group. A whole raft of international texts were also applicable: the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal, provisions of the International Convention for the Prevention of Pollution from Ships (Marpol 73/78) and those of the International Convention for the Safety of Life at Sea (Solas) published by the International Maritime Organisation. The EIA specifies all the rules to be followed in the area of health, safety and the environment, referred to as the Operations Integrity Management System (OIMS). Although developed independently by Exxon, the OIMS used complies with the 1996 ISO 14001 standards on environmental management (Exxon, 1999a).

Compliance with these norms was an integral part of Chad's and Exxon's commitments vis-à-vis the World Bank. Classified as Category "A" in the World Bank Group's project nomenclature, the Doba petroleum project required that an EIA and EMP be done beforehand. The Operational Directive (OD) 4.01 specified that *"where applicable, EAs should address [issues] which are subject to the bank's policies and guidelines"*, particularly issues related to the disclosure of information, the protection of cultural property and the environment, and the resettlement and compensation of population groups affected by projects funded by the World Bank (Maoundonodji, 2009). The EMP stipulated the application of impact mitigation measures so as to avoid adverse impacts or bring them down to acceptable levels. It contained information on environmental management as well as on the organisation responsible for environmental surveillance and the responsibilities of participants in the project, including the Chadian government. It recommended a whole series of measures concerning atmospheric emission control, waste and dangerous substances management, management of cultural sites, accident prevention, etc. Monitoring and control measures also contributed to the project's originality. In the sphere of governance, the *Collège de contrôle et de surveillance des revenus pétroliers* (CCSRP – Petroleum Revenue Oversight and Control Committee), in which Chad's civil society was duly represented, was responsible for verifying that the use of petroleum funds complied with the 1999 Law No. 001.

In the environmental field, alongside the ICG's activities, a three-pronged mechanism was set up: the operator had its own monitoring system, Exxon Environmental

[70] Particularly the applicable technical norms and specifications published by the American National Standards Institute (ANSI), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API) and the American Society for Testing and Materials (ASTM).

Management Plan (EMP), whose functioning has been described in Moynihan *et al*, 2004. The World Bank supported the creation of an inter-ministerial body responsible for monitoring the project's environmental aspects on behalf of the Chadian State: the CTNSC. Between 2000 and 2007, it comprised twenty-one persons, including twelve at executive level. Finally, the ECMG carried out external monitoring specific to environmental issues. Appointed by the International Finance Corporation (IFC), one of the World Bank's subsidiaries involved in the project, it undertook one to two visits per year to verify the compliance of practices with the EMP's specifications.

An IAG was set up by the World Bank in 2001 to carry out bi-annual follow-up missions to oversee the entire project. This was a group of independent experts consisting of five members. It was given the mandate to supervise implementation of the Chad-Cameroon project and to advise the lending bodies, the host governments and the World Bank on any possible problems. Its mission covered capacity building, environmental monitoring, regional and local development, management of the oil revenue and good governance. The IAG reported directly to the World Bank Chairman. It was funded by the World Bank and European lending bodies (Maoundonodji, 2009). At the end of its term in June 2009, the ICG had produced about twenty field mission reports.

Finally, the World Bank set up supporting measures. Two loans by the International Development Association (IDA) to Chad helped fund a project to manage the petroleum economy and a petroleum sector management capacity-building project (Maoundonodji, 2009: 274). The latter made it possible to fund the CTNSC as well as emergency measures for mitigating the anticipated impact of the petroleum site – which was likely to create considerable migratory flows towards work site areas, as well as exert unsustainable pressure on the existing infrastructure and the environment (Magrin, 2009). The FACIL (Local Initiatives Social Fund) was implemented to address these issues and obtained mixed results (Magrin, 2003).

2.3.4. *Constant debates that sometimes moved the project forward*

The debates surrounding the design and then implementation of the project between 1996 and 2003 helped to raise environmental regulation standards and improve impact compensation measures.

The actions of international NGOs undertaken between late 1997 and early 1998 were intended to block implementation of the project and, above all, prevent it from receiving IDA funds (Maoundonodji, 2009: 265-266). One such action was the campaign "*Banque mondiale, pompe l'A'fric des compagnies pétrolières*" ("World

Bank, the oil firms' money pump in Africa") run by the NGOs, Agir Ici (see Agir Ici, Survie, 1999) and Les Amis de la Terre. In addition, certain German political circles that were sensitive to the arguments advanced by the NGOs carried the debate into the World Bank itself (*ibid.*).

In Chad, the first few EIA documents to circulate in 1997 were initially unavailable to the general public. With the help of international civil society organisations from the home countries of the consortium's members (US, Europe), Chadian NGOs mobilised against what was perceived as a lack of documentation. At a seminar held in Donia in January 1998, national civil society demands were structured around governance and environmental themes. As a result, certain points in the EIA study and the formulation of the EMP were reviewed. The debates on the EIA – which lasted over two years – thus helped to improve the quality of the assessment and facilitated the acceptance of its final version and its implementation by the stakeholders. In total, the Doba project's environmental documentation comprises nineteen volumes covering all of the aspects required by the World Bank Group's contractual agreement, safety policies and operational directives (Exxon, 1999a). Six of these volumes specifically relate to the EMP.

In April 1999, a second major civil society seminar was held in Bébédja. These two high points of civil society mobilisation helped to set up NGO networks to monitor petroleum operations, and various specialist organisations. The CPPN networks in N'Djamena, the CPPL in Moundou, the *Réseau de suivi des activités pétrolières* (RESAP – Petroleum activities monitoring network) in Sarh, the *Entente des populations de la zone pétrolière* (EPOZOP – Network of Community-based Organisations) in the oil-producing cantons were all created in this context (Maoundonodji, 2009: 267). Shortly after, in December 2001, the GRAMPTC (*Group for Alternative Research and Monitoring of the Chad-Cameroon Oil Project*) was created in N'Djamena with the objective of helping civil society to develop more relevant technical arguments regarding the impacts of oil-related activities.

The major controversies focused on a limited number of subjects. In Cameroon, the debate addressed the future of the Pygmies, biodiversity and the coastal fragility of the Kribi site. In Chad, discussions first focused on governance: the setting up of the IAG was inseparably linked to the 1997-1998 international civil society campaigns and, likewise, the composition of the CCSRP was modified following the Bébédja seminar so as to be more inclusive of civil society. Then, as the start of construction work drew closer and the initial impacts were felt, demands shifted to environmental issues: the EIA came under criticism and was subsequently revised.

Despite all the measures put in place, the construction work led to various tensions in the petroleum zone (see Magrin, 2003). The local communities and NGOs denounced inflation, the lack of jobs compared to expectations (and unfair competition from non-natives or foreigners) and the problems raised by compensation.

Compensation issues crystallised much of the discontent: the neo-traditional chiefs engaged in corrupt practices, often taking 10% of the amount paid; individual compensation roused jealousies within hitherto egalitarian social structures; and group compensation was often poorly adapted (the choice of the community facilities was limited and the quality questionable) and the rates were often unfair. The case of mango trees is emblematic of what civil society mobilisation was able to achieve: after a trial of strength with the consortium and an appeal to the World Bank, civil society managed to have the compensation rates re-assessed for each mango tree felled under the project, with the amount paid for a mature tree being raised from CFAF 3,000 to 550,000 (Petry and Bambé, 2005:83-87).

The loan agreement provided for a Regional Development Plan (RDP) to respond to the additional pressure placed on infrastructure and natural resources by the influx of worksite migrants. Yet, the drafting of the Plan only began after much delay, when the construction work was almost finished (2003). Furthermore, the methodology used did not involve civil society, who thus blocked the process. Similarly, despite the enforcement of stringent Exxon and World Bank standards, a number of non-compliance cases (with regard to the EMP) on the work site were reported (GRAMPTC, 2003; GRAMPTC, 2004; also see ECMG or IAG reports).

Of particular note during the 1996-2004 period are the endless debates, which mainly focussed on environmental issues both before and during the construction of the oil facilities and which brought about some improvements. Moreover, it can be seen that the enforcement of strict environmental standards and substantive supporting measures (FACIL, compensation) gave rise to the usual environmental impacts, but these were factors that heightened social tensions. The national capacity building projects (run by the World Bank for the Chadian State and by international civil society for Chad's civil society) were not up to challenging the persistently high level of asymmetry between the actors. The situation thus sparked off recurrent protest movements in the oil zone and social disturbances that would continue into the following phase of operations.

2.4. A model tested by time (2005-2010): towards a slackening of regulation?

2.4.1. *The crisis with the World Bank and environmental regulation*

The crisis between the government of Chad and the World Bank modified the environmental regulatory framework of the Doba project without seriously calling it into question.

Indeed, at the end of 2005, the government decided to change the 1999 Law No.001. A new law was adopted that abolished the Fund for Future Generations, increased the share of revenue that could be used for the State's current expenditures and lengthened the list of priority sectors (particularly security and justice). This change acted as a catalyst for the tensions simmering between Chad and the World Bank. After two years of strained relations marked by successive tensions and provisional agreements,^[71] the crisis was settled in August 2008 with Chad's early repayment of the World Bank project loan (for details, see Pegg, 2009).

The environmental monitoring system was the first to bear the brunt of the crisis. In 2006, the *Coordination nationale du projet pétrole* (CNPP – National Coordination on the Petroleum Project) was dissolved. This structure had headed all the World Bank operations that had supported the oil project. The CTNSC, which had been attached to the CNPP, no longer had any resources to hand. The various ministries had disapproved of an ad hoc body capturing all environmental monitoring resources, and thus welcomed the disgrace that fell on this senior-level committee – which moreover was suspected of being too direct an emanation of the World Bank. Likewise, the support programmes run by the CTNSC and thus perceived as being under World Bank influence were blocked, as the Chad government now balked at funding their operations. This was the case, for example, for FACIL and the RDP, whose activities had resumed in 2004-2005 but were again interrupted.

The environmental monitoring of oil activities thus remained adrift for a while, being shared by the Ministry of Petroleum, the *Société des hydrocarbures du Chad* (SHT – Chad Hydrocarbons Company) and the Ministry of Environment. Both of these ministries had responsibilities in the area of environment and/or petroleum,

[71] In a geopolitical context marked by the entanglement of the Darfur war and the Chadian politico-military turmoil, in which the United States and France acted as mediators between Chad and the World Bank to preserve as much stability as possible in the country that was used as a rearguard base to manage humanitarian work in Darfur.

but no department was specifically in charge of monitoring the oil industry environment. The ministries were called on to manage situations on a case-by-case basis – for instance, when the first oil leak occurred in August 2008 (see below). However, it was clear that the demise of the CTNSC had weakened the Chad government’s institutional ability to address oil-related environmental challenges. In April 2009, after two years of interruption, the CTNSC was “revived” (SHT, 2009), staffed with only two executives and based in the Ministry of Environment, as the CNPP and CTNSC premises were already occupied by the CCSRP and the SHT, a new national company created in 2006. The new CTNSC was given a very limited budget of CFAF 30 million. It was given the coordinating role of mobilising technicians from different technical departments in line with the task to be undertaken. A much more ambitious budget in 2011 (a government allocation of CFAF 600 million) seemed to signal the institution’s return to grace: the implementation of the CNPC-managed Rônier project most likely made national leaders more aware of the importance of having such a body.^[72] This signal was confirmed when the funds were effectively mobilised.

The continuity of the project’s external monitoring was partly ensured. The IAG completed its assigned task – to accompany the project for six years after the commissioning of the pipeline – and submitted its final report in June 2009.^[73] However, the ECMG continued its monitoring work under the terms of the IFC loan granted to Chadian State to finance its participation in the pipeline’s management company. It thus remained a thorn in the government’s side given that any notice of non-compliance would be likely to interrupt the marketing of crude oil.

As far as international civil society was concerned, developments in environmental monitoring were also ambivalent. The international civil society organisations that had benefitted most from media coverage now showed waning interest in Doba. At the same time, the World Bank – which the media had waved as a “red flag” – was no longer in the picture, and the spotlight had shifted from the Chad project to other subjects, such as the start-up of production in Ghana at the end of 2010 under a project that was meant to provide a new model of oil governance. However, some organisations did continue to fund the civil society players engaged in advocacy or monitoring work in Chad, as for example Oxfam, Swissaid, Cordaid, etc.

[72] Interview with Mahamat Bechir, CTNSC’s Executive Secretary, Ndjamen, August 2010.

[73] The IAG reports confirm the serious efforts of this body, which had been able to sustain a long-term balanced dialogue with all the stakeholders. Regrettably, the website on which all its reports had been uploaded was shut down soon after the end of its activities in 2009.

The results obtained by Chad's civil society were also mixed. Although the networks and organisations monitoring the oil industry had managed to pursue their work and thus acquired some degree of competence (CPPN, CPPL, GRAMPTC), their effectiveness in environmental monitoring was curbed by various constraints. Not only did they enjoy less international support, but some organisations also lost their independence, if not their credibility, by working for Exxon on farm projects rolled out as part of the compensation programme. This was the case, for instance, of Assaïd, Africare, World Vision and even the *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ).^[74] These organisations were also weakened by the departure of the World Bank, which they had relied on extensively rather than trying to construct a dialogue with the State.^[75] Finally, Chad's civil society proved to be much more at ease dealing with human rights or compensation issues than with environmental monitoring strictly speaking, as it had neither the specialised technical skills nor the necessary resources (to undertake countermeasures, among other things).

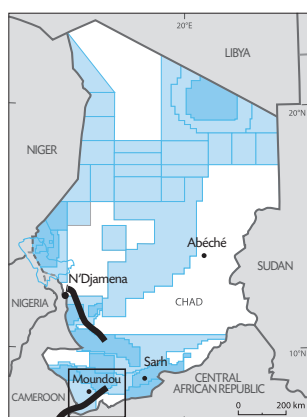
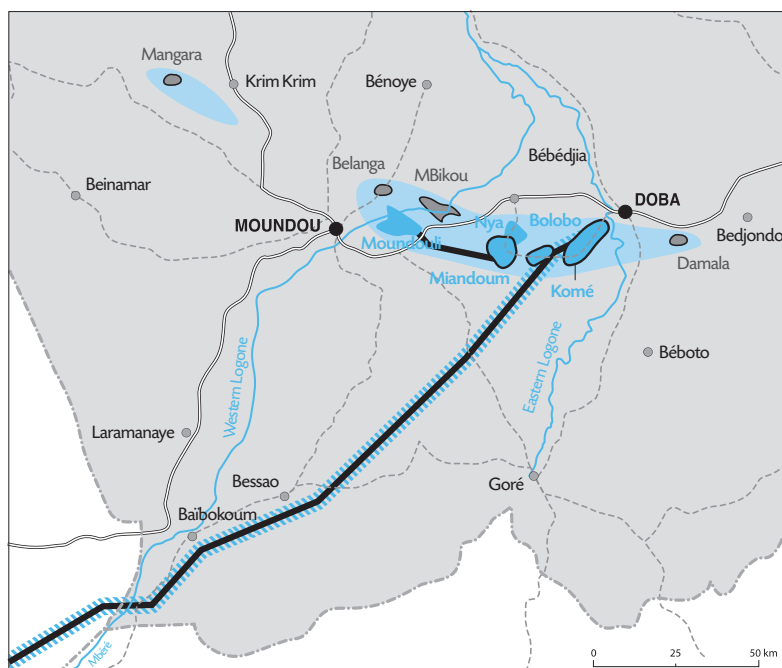
The crisis between the World Bank and Chad thus altered the landscape of Chad's environmental regulation. Thereafter, the State's monitoring capacities declined somewhat and the positions of civil society became more fragile. With the delivery of the social closure certificate to the consortium by ECMG in 2005, the World Bank's withdrawal in 2008 and the end of the IAG's mandate in 2009, external supervision of the Doba project's environmental aspects eased off considerably. It was mainly limited to the ECMG's activities, which continued on account of the IFC loan. However, the operator itself – Exxon – seemed to be complying rigorously with the regulations.

[74] GTZ is not a NGO and its involvement in this type of programme is even more astonishing.

[75] Interview with Naji Nelembaye (CPPL, Moundou) and Soumaine Adour (Intermon Oxfam, Ndjamena), August 2010.

2.4.2. The petroleum industry and under-development: an uneasy co-existence nonetheless

Map 2 The Doba project and its developments



Exploitation phases EXXON (since 2000)

Initial oilfield

Satellite oilfield

Opic and Griffith (since 2010)

New oilfield

Environmental impact

During construction (2000-2003)

Exploration and development of wells

Allocated block

Available block

Zone outside blocks

Oil pipeline

Tarred road

Track

Main city

Other town

Oil pipeline

Source: Design: G. Magrin, Production: G. Decroix, based on Exxon data.

Environmental regulation of the world's leading company in the face of the project's developments

The bulk of environmental regulation therefore rested on Exxon. The world's leading oil company complied with the sector's best practices as far as ethics and the environment were concerned; Exxon's standards are even more demanding than those of the World Bank and its safety statistics among the best in the petroleum world^[76] (see also Moynihan *et al.*, 2004).

Different sources have vouched for the quality of the environmental regulation implemented for the Doba project. The IAG noted in its final report that the project's main infrastructure construction, which had begun in October 2000, was completed in July 2003 without any major incidents in terms of serious environmental or social impacts (IAG, 2009). Based on its field trips, the ECMG certified that all non-compliance situations had been managed in line with the EMP. Based on this, a completion certificate was issued to the Consortium on 24 October 2009 (ECMG, 2005).

The publication of Exxon's annual reports on the project provided information on the effectiveness of the HSE system. The 2009 annual report showed, for instance, the good results obtained in the field of health thanks to the fight against malaria among the employees (2002-2009); in the sphere of safety, the incident rate was half the average for the US petroleum industry (Exxon, 2009a).^[77]

In the area of the application of environmental regulations, Exxon has made significant efforts in recent years. Hence, between 2006 and 2009, the monthly number of non-compliance situations^[78] in relation to the EMP was six times lower as compared to the number of such cases recorded in 2005 – *i.e.* down from 4 in 2005 to 0.7 in the first semester of 2009. According to the operator, this improvement was achieved despite the fact that the total number of hours worked, used as a measure of the project's activities, remained quite high (Exxon, 2009a).

A presentation given by Exxon in 2010 in Moundou to civil society organisations from southern Chad (see Exxon, 2010) provides a concrete insight into the different

[76] Interview with Scott Miller, Director of Exxon Chad, Ndjamen, June 2010.

[77] For a more detailed analysis, see Maoundonodji, 2010.

[78] A classification of non-compliance situations made it possible to ensure that they were well monitored and that appropriate solutions were provided: level 1 (quick alert, no significant impact on an identified resource, but not in compliance with EMP); level 2 (immediate action required; could lead to serious impact on an identified sensitive resource); level 3 (serious; impact on an identified sensitive resource).

approaches of environmental management almost ten years after the project's start. Exxon Chad had put in place an improved waste management system, including the distribution of 3,000–4,000 tonnes per year of used material (wood, metals, etc.) to the “communities”,^[79] which was one of one of their demands. A watch was kept on air quality; the asphaltting of the main project roads was taken up in response to the health problems caused by dust. Exxon's ambition was to limit flaring, which has gone down significantly since 2008,^[80] to less than 1 million cubic feet per day. Surface and ground water were monitored through several test wells and the impact of activities on the water table seemed to be low. A watch was kept on spillage from valve 3; and improvement objectives have been proposed for 2011.

In the socio-economic field, 164 public consultations involved 9,400 participants in 2009. Since the start of the project, individual compensation benefited about 10,000 persons, from 314 villages, for a total amount of CFAF 7.4 billion. Since the end of construction in 2002, generally only 30–50 villages per year have been involved. The households that were the most impacted and had to be resettled were given training in improved farming techniques (156 in 2008; 70 in 2009) or in other fields and, in nine cases out of ten, their former living standards were re-established or improved (Exxon, 2010).

As often happens in extractive industries, the project implemented between 2004 and 2010 did not correspond exactly to what had been initially planned. In fact, to maintain the desired production curve despite unfavourable geological conditions, the consortium had to deploy a “spoke-and-wheel” network system (Maoundonodji, 2009: 270) connecting Kobé to the satellite oil fields of Moundouli, Nya (2005–2006), M'Bikou, Belanga and Mangara. It also had to densify the well network in the three main oil fields of Komé, Miandoum and Bolobo, where the number of wells gradually went up from 300 to 800.

As each new oil field came on stream, it was accompanied by an update of the EMP. The project tried to limit land acquisition as much as possible – as of 2005, this remained more or less stable at a level of 2,500 ha, of which 1,000 was for permanent facilities and 1,500 for temporary occupation. One thousand hectares have been restored and returned to the “communities” since 2005 (Exxon, 2010).

[79] We have re-used the term used by petroleum companies in Chad and elsewhere, although it is debatable. In Europe, would we speak of “communities” or local residents or even citizens?

[80] It is difficult to understand the real reason for this reduction – was it due to repeated criticism? Or to a decrease in production? Or to new techniques for gas-powered energy in production processes?

A new compensation approach had to be instituted to deal with the fresh problem posed by villages located within the oilfields development area, where a significant portion of the land and households were likely to be impacted. In 2006, an independent commission appointed by the World Bank and Exxon issued a report on the challenges related to new land requirements for the project. A survey conducted in the 15 most affected villages covered 3,000 households and mapped 16,000 fields using a Geographical Information System (GIS). This provided an embryonic land registry system for the oil development area. The survey basically made it possible to show that farmers were defrauding the compensation system. It revealed that only 12% of households were affected and 7% were considered to be in major difficulties on the basis of the EMP standards – according to which each household member had to have one-third of a hectare – although many of the households could be considered to be highly vulnerable even before the project.

In response to the survey, the Land Use Mitigation Action Plan (LUMAP) project was set up in 2007 (see Exxon, 2009b and Environ, 2010). All those who were impacted by the project and left with less than one-third of a hectare that could be cultivated were eligible for resettlement. This “land-against-land” compensation did not exclude payment in cash, but it offered the additional option of resettlement to those who were eligible, so as to prevent some of them ending up with no land or resources after having used up their compensation unproductively. Within this framework, some people were trained in lowland farming practices with the support of the Africa Rice Center (ARC), the *Institut tchadien de recherches agronomiques pour le développement* (ITRAD – Chadian Institute of Agronomic Research for Development) and the *Office national de développement rural* (ONDR – National Office for Rural Development). This marked a revolutionary change in Chad’s savannah regions where, until recently, flood-risk areas were barely developed (Magrin, 2001). Others received off-farm training if they did not have land and wished to change occupation. The fifteen most affected villages received a second community compensation, which somewhat gainsays the idea developed in the 2006 study according to which petroleum activities had no real impact on these villages. However, since the start of the project, all the measures implemented have seemed ineffectual in the face of the confusion and distress reigning in the petroleum development area.

Box 1 *The Doba project's environmental regulations, or the limits of the example it set*

Rigorous environmental management by the world's leading company, the multi-level monitoring system and the dialogue encouraged by the World Bank made it possible to mitigate the project's impacts (Photo 3). But these efforts did not prevent recurrent criticism about technological choices, such as that of flaring production gases (until 2010; Photo 4). Despite accompanying measures, the densification of the network of oil wells made some local residents' lives more precarious and fostered social malaise in the production area itself (Photo 5).

Photo 3 *Spreading of molasses to limit dust emissions on a village road (Doba oil zone, June 2004)*



Photo 4 *Production gas flaring in Komé (May 2005)*



Photo credit: Géraud Magrin.

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Photo 5 *Aerial view of the Komé oil-well network
(May 2005)*



Photo credit: Géraud Magrin.

Pending issues and growing distress

A number of problems have fuelled constant protest in the oil zone despite the measures implemented. In our view, after ten years of exploration and production, these problems are indicative of the almost inevitable asymmetries and stark contrasts that arise when such facilities are set up. They also show what happens when vulnerable societies come face to face with an ultramodern industry that, in the popular imagination, embodies immense power and wealth and transforms their environments.

Thus, inflation-led tensions (especially during the construction phase) and those related to local employment (always insufficient) were compounded by tensions around corruption (money taken by chiefs or other intermediaries from compensation payments). Despite the measures taken by Exxon, corruption proved difficult to eradicate in a context where it was common practice. Compensation payments raised a host of problems: whether it be in-kind or community compensation, the options offered were too limited; likewise, the community facilities provided were considered to be of poor quality and thus barely used. A further difficulty involved how the notion of land tenure was dealt with by the compensation system. For instance, compensation

was based on land use rights as they stood at the time of the survey, which led to frequent disputes between right-holders and “owners”.^[81] Furthermore, in milieus characterised by both poverty and egalitarian societal structures, Exxon failed to train people to manage sums of money as large as the compensation payments, which meant that some soon had no land or compensation money left. Villagers also complained about security pressures, as policemen used the risk of theft and sabotage as an excuse to impose what virtually amounted to a 6 pm curfew in some villages such as Ngaraba.^[82] Apparently, none of a complaints made were dealt with.

Also, a number of more or less serious cases of non-compliance were observed (see reports by GRAMPTC 2004 and 2010, IAG and ECMG). These concerned waste material (cars, computers) that was prized by the villagers yet, much to their annoyance, buried; sometimes the restoration of land and quarries (death of children and animals); and oil spills.

The measures taken over ten years bear no comparison, for instance, with those implemented in the Niger Delta, which has been increasingly scarred by decades of extremely weak environmental regulation. Yet despite this, all the discussions with villagers from the oil zone revealed their disappointment and distress. The dreams stirred up by the World Bank and Exxon teams were seen as lies: the World Bank’s Vice-President had allegedly told the affected villagers that they were going to witness the dawn of a “second America”;^[83] Ellen Brown, the anthropologist in charge of Exxon’s community relations, did not seemingly keep all her promises concerning the improved living conditions and facilities that the villages should have enjoyed.

The oil company was involved in endless debates in a situation of extreme asymmetry. Quite often, the villagers or NGO officials would complain, for instance, about the reduction in millet yields (ears of millet seemed to be shrinking), which they blamed on petroleum activities. Could the lower cereal output rationally be blamed on the project (dust, seismic reasons, electrical fields, change in biodiversity, etc.), or was it only a consequence of “normal” land depletion, which, as elsewhere in the Sudanese savannahs, resulted from extensive farming systems in which land saturation linked to demographic growth forced a shortening of fallow periods? In this case, what part did land acquisition by the petroleum project play in these land dynamics? The

[81] Interview with Moustaphe Daoud and Essaïe Rockoulyo (Exxon), Doba, August 2010.

[82] This kind of curfew was not acknowledged by the administrative authorities, but the inhabitants we met believed that one was being enforced.

[83] Interview in the form of a focus group with Ngalaba and Béro villagers, August 2010.

absence of expertise outside of Exxon did not help objectify the cases raised, because neither the State nor the NGOs were in a position to argue with any precision on this type of issue.

An assessment of the Doba project's environmental regulation thus reveals the operator's professional practices, with intermittent multi-layer monitoring – because of the crisis between Chad and the World Bank –, persistent asymmetries and a deep-seated feeling of distress among the petroleum zone's inhabitants. The impression gained during a visit to the petroleum zone in 2010 was not too far from the conclusions of a study conducted at the end of the construction period (Cogels and Koppert, 2004), according to which living conditions were materially better near to the oil derricks, but the local residents were in disarray.^[84]

2.4.3. *Effects of the oil cycle and the potential for changing trajectories*

At this point, we will examine the first two or three phases of the Doba project oil cycle (construction phase; production start-up; mid-way production and oilfield expansion) through the prism of the mining-cycle model. According to this model (van Vliet, 1998; Magrin and van Vliet, 2005), as the cycle advances, the propensity of companies to grant compensation and their willingness to negotiate wanes, whereas the environmental impact of ageing facilities becomes increasingly visible and the turnover of operators and sub-contractors causes standards to lower. At the same time, civil society and local residents become increasingly able to formulate their demands. The intersection of these two opposite trends creates heightened tensions.

Yet the use of this model runs counter to the dynamic nature of production: Exxon rightly considered that the strongest impacts would occur during the construction phase (2000-2003) and would be compensated accordingly. However, the densification of the oilfields after 2004 and the development of satellite fields prolonged this construction phase. The question is then whether the LUMAP is to be seen as a sign of the companies' initial willingness to compensate those affected? Or, on the contrary, should the geomatic monitoring methods that were used following LUMAP's implementation be interpreted as a signal of closure in step with the progression of the project cycle?

[84] Studies were conducted in villages affected by the construction work and in other non-affected villages, before and after the construction period. They reveal that socio-economic indicators were higher in the former, but that conflicts, tensions and symptoms of crisis were also more widespread.

The consortium's subsequent openness to negotiations undoubtedly took different forms compared to the situation observed at the start of the project. In fact, while the company emphasised that community consultation was to continue, several of our interlocutors^[85] deplored the fact that communication was poorer once the production phase began. The former regular meetings gave way to occasional meetings associated with specific problems. The waning of international interest and the World Bank's withdrawal may also perhaps explain why communication was now directed more towards the "communities" than towards civil society and its intermediaries within village authorities. Finally, the Interior Ministry's ban on a workshop planned for March 2010 to address the utilisation of the 5% of oil royalties intended for the oil-producing region also seemed to confirm a hardening of the government's stance, although purely conjunctural political interpretations are not to be excluded.

The first hydrocarbon spills were reported in 2008. On 25 August, a spill of 35 barrels was discovered between the villages of Dobara and Béto II, near Thio Pond (SHT, 2008:17). NGOs criticised the malfunctioning of the surveillance system, which Exxon had nonetheless vaunted in the initial negotiations as being state-of-the-art. However, the leak did not occur along the main oil pipeline – indeed equipped with sensitive detection systems – but from unequipped secondary conduits. The leak was discovered by village patrol teams recruited by Exxon to monitor the above-ground pipeline sections. In fact, the guidelines recommended aerial surveys along with one or two annual inspections. The use of these teams improved surveillance, as they were able to spot trees with deep roots, land subsidence at vehicle crossing points or at makeshift quarries dug out by villagers in search of clay, all of which are anomalies difficult for planes to detect.^[86] This practice, which originated on the Cameroonian side of the pipeline, employed about a hundred people in Chad and covered eight to ten pipeline sections. This apparently rudimentary approach in fact resulted in a higher level of surveillance than that required by the standards. The occurrence of a leak may have been a sign of ageing equipment, but the manner in which Exxon responded – setting up an innovative surveillance system, as well as measures to monitor the polluted valve-3 site – does not seem to indicate a weakening of environmental regulation.

The progression of the mining cycle has also made it possible to learn many different lessons in addition to improving the capacity of the residents in the oilfield develop-

[85] In particular, the head of the Béro and Nadji Nelembaye canton and CPPL, whom we met in August 2010.

[86] Interview with Théophile Pinabéï, Exxon HSE, 23 June 2010.

ment area to formulate their demands. Whether at the individual or institutional level, these lessons influenced the context in which CNPC was set up in Chad.

Over ten years, Chadian managers have been trained in oil-industry skills, particularly in the area of environmental regulation. National staff from Encana^[87] – a Canadian company that had conducted intensive exploration surveys between 2000 and 2006 before selling its stakeholding to CNPC in 2006 – are now sometimes employed by CNPC as consultants to carry out impact studies, or by its HSE department. In Exxon, locals have been increasingly appointed to managerial positions particularly in the area of HSE. At the government level, although the CTNSC's institutional capacities still need reinforcing, the individual experiences acquired therein are sometimes put to use elsewhere through the services of engineering consulting firms, some of which, such as ISM Consult, have worked for CNPC (and sometimes also for Exxon). Likewise, despite the difficulties mentioned above, the major civil society organisations (CPPN, CPPL and GRAMPTC) have managed to set their monitoring activities on a long-term footing and consolidate their experiences. The enhanced dialogue with the State – as shown by field trips jointly conducted by NGOs and government officials – has demonstrated that, in the absence of the World Bank, new types of relationships have been forged.

[87] Sometimes initially trained in Exxon at the peak recruitment period during the construction phase.

2.5. Conclusion

The Doba project was coincident with a progressive improvement of the environmental regulation system in Chad. Without any doubt, the presence of the World Bank has helped (or spurred) the design and implementation of environmental and social rules of the game for the petroleum sector and beyond. These regulations were the result of important, substantial and continued debates between the World Bank, the State, civil society and the consortium, allowing for an improvement of the quality of the environmental regulations and easing their implementation and enforcement.

However, we cannot demonstrate that the World Bank-supported project was the sole catalyst for these developments. They are, in fact, part of a slow and gradual densification of Chad's regulatory and institutional framework for environmental protection, which had begun before the Doba project and continued even after the crisis between Chadian State and the World Bank. This is evidenced by the adoption of the new Petroleum Code, the 2007 Hydrocarbon Law and the implementing decrees for the 1998 Environmental Protection Principles published in 2010.

The crisis of the World Bank system in 2006 affected above all the environmental monitoring capacities of the two stakeholders that had received most support from the Bank – the State and, to a lesser degree, civil society. Nonetheless, the crisis seems to have had little impact on the actual content of environmental regulation, which still depends for the most part on the operator's (Exxon) own responsibility. In the longer term, however, this situation is fraught with risk.

In fact, despite all the support and compensation measures implemented, the oil activities seem to have had a socially disruptive impact on a few most affected cantons. The rejection of the "oil implant" by some of the region's residents has again raised the issue of how legal norms, as enforced by the operator, relate to social norms, which are a wellspring of legitimacy.

Over and above the crisis with the World Bank, it is around the Doba project that national individual and institutional capacities have been strengthened in the area of environmental regulation. Today, these certainly influence the context in which CNPC project operates. It is also true to say that the disappointment of the villagers living in the vicinity of the Doba project has not dampened the expectations of villagers from Koud Alwa – the closest village to the Rônier project base – who hope to receive *"as much as Doba's villagers"*.

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Part Three

3. The Rônier project for China and for Chad: the challenges of a new petroleum adventure

Géraud MAGRIN and Gilbert MAOUNDONODJI

3.1. Introduction

Work on the Rônier and Mimosa oil production sites started up on 1 July 2009 in Chad's centre-south region, under the partnership agreement between CNPCIC and the Chadian government. From the long-run perspective of Africa's economic history, the so-called Rônier project is indeed a novel venture. The continent's integration into the global economy has been primarily through its export of unprocessed primary commodities. Whereas the investments that have driven the rapid expansion of oil exploitation since the 1950s and 1960s initially targeted the export of crude, in a few cases these have subsequently aimed to develop the use of hydrocarbons for Chad's national needs. But this type of activity is still limited.

CNPCIC, however, launched its operations in Chad by connecting its oilfields to a refinery where production is directed at internal markets, both in Chad and regionally. Nonetheless, the Rônier project remains in step with China's sometimes controversial investment strategy in Africa, whereby the overarching political thrust to secure China's raw materials supply has set bilateral political relations centre stage, much to the detriment of environmental protection and the interests of national stakeholders (Alden and Alves, 2009; Munson and Zheng, 2010). Thus, what we will examine here is whether the Rônier project and the possible outcomes – as perceived through the prism of its initial construction phase (2009-2011) – present a high level of risk for the host environment or, on the contrary, whether they are likely to create a turning point in Chad's development by providing energy and stimulating industrialisation.

There is as yet no scientific literature or even grey literature on the Rônier project, apart from one monitoring report (GRAMPTC, 2010). The national press has barely covered anything other than official work site inauguration ceremonies, while the international media have totally ignored the subject. This silence is in strong contrast to the media hype that surrounded the World Bank's support for the Exxon-Doba project. In Chad, the rare texts referring to negotiations to guarantee local utilisation of the energy derived from oil exploitation are about the Doba project: certainly, since it began and until recent times, gas-flaring in the Komé production fields has been criticised by NGOs; the government also wished to obtain additional electricity supply from Komé's power plants^[88] to feed into the national grid (see Petry and Bambé, 2005). However, when this question is mentioned in the successive IAG reports (see Part 2), it is clear that satisfying such demands is a difficult issue. Moreover, the mainstream literature on Chinese investment projects in Africa, particularly in the extractive sector, presents a rather negative view of their environmental impacts, for several reasons:

- The strategic dimension of these investments gives them a political dimension that relegates environmental concerns to second place.
- These investments are made in sectors with a high environmental impact (oil, mining, energy and related infrastructure) and in the vulnerable national settings of LDCs with low regulatory capacities.
- Finally, the use of environmental standards that are less stringent than those followed by Western majors could constitute one of the competitive advantages of Chinese firms (Bosshard, 2008; Soares de Oliveira, 2008; Alden and Alves, 2009).

In this chapter, two hypotheses will be tested:

- At the local level, the impacts and risks seem manageable, since the milieu does not have a very high degree of sensitivity (ecologically and geopolitically) and the foreseen activities produce impacts generally found for this kind of investment.
- The refinery enhances Chad's prospects for economic development.

[88] Komé's generators run on gas and crude oil. They are used to operate the oil export system. The use of part of the energy produced for regional needs seems technically possible – for instance, one turbine (of the four currently installed) could meet almost all the energy needs of the Sudanian zone, which is home to about 45% of the country's population. The question of the conditions under which the energy could be transported is an underlying problem that needs to be resolved first.

This chapter brings together information on China, Chad, and the Rônier project itself. For reference, we thus recall the findings of the general scientific literature on China's presence in Africa, particularly in the field of hydrocarbons. To this, we have added information based on a discussion held in June 2010 with Mr Huang Mingyuan, the Economic and Commercial Counsellor at the Chinese Embassy in Chad. For the project itself and the challenges it raises for the host areas in Chad, in addition to the meagre openly available documentation, we have mainly drawn on the *SHT Magazine*, the press and the provisional EIA documents accessible to us.

To begin with, we will describe the geographic setting of the Rônier project in Chad and the project itself. We will go on to present the stakes involved from China's and then Chad's perspective.

3.2. The Rônier project in context

The Rônier project marks a third phase in the history of oil in Chad, after the period of missed opportunities (1973-2000) and then the implementation of the Doba project (since 2000). From an environmental and socio-political standpoint, the areas involved are moderately sensitive. However, the outlines of the project as we now know them will undoubtedly change.

3.2.1. *The origins: from the legacy of Encana to the shadow of Doba*

In the history of Chad's oil industry, the oil deposits linked to the Rônier project were upstaged by the Doba deposits, which were discovered earlier and are more extensive. Oil exploration in Chad had begun in the 1950s with the Doba, Doséo and Salamat oil basins and was not extended to the Bongor and Lake Chad Basins until the 1960s-1970s. Exploratory operations were launched by variously configured and predominantly American consortiums, initially dominated by CONOCO. The first major discovery came in 1973 in the Doba Basin. Shortly afterwards, an exploitable but relatively small deposit was found in Sédigui, close to Rig Rig, about 100 km to the north of Lake Chad.

In the 1980s and early 1990s, exploration activities slowed down considerably due to the civil war (1979-1984) and the ensuing political and military instability. It was the operations in Doba that spurred the revival of the oil industry in Chad in the second half of the 1990s (see Part 2). The recent history of the Bongor oilfield really began with the exploration, development and transportation agreement of 23 February 1999 between Chad and the Cliveden Petroleum Company. Although the oil consortium underwent occasional restructuring, this agreement underpinned the exploration

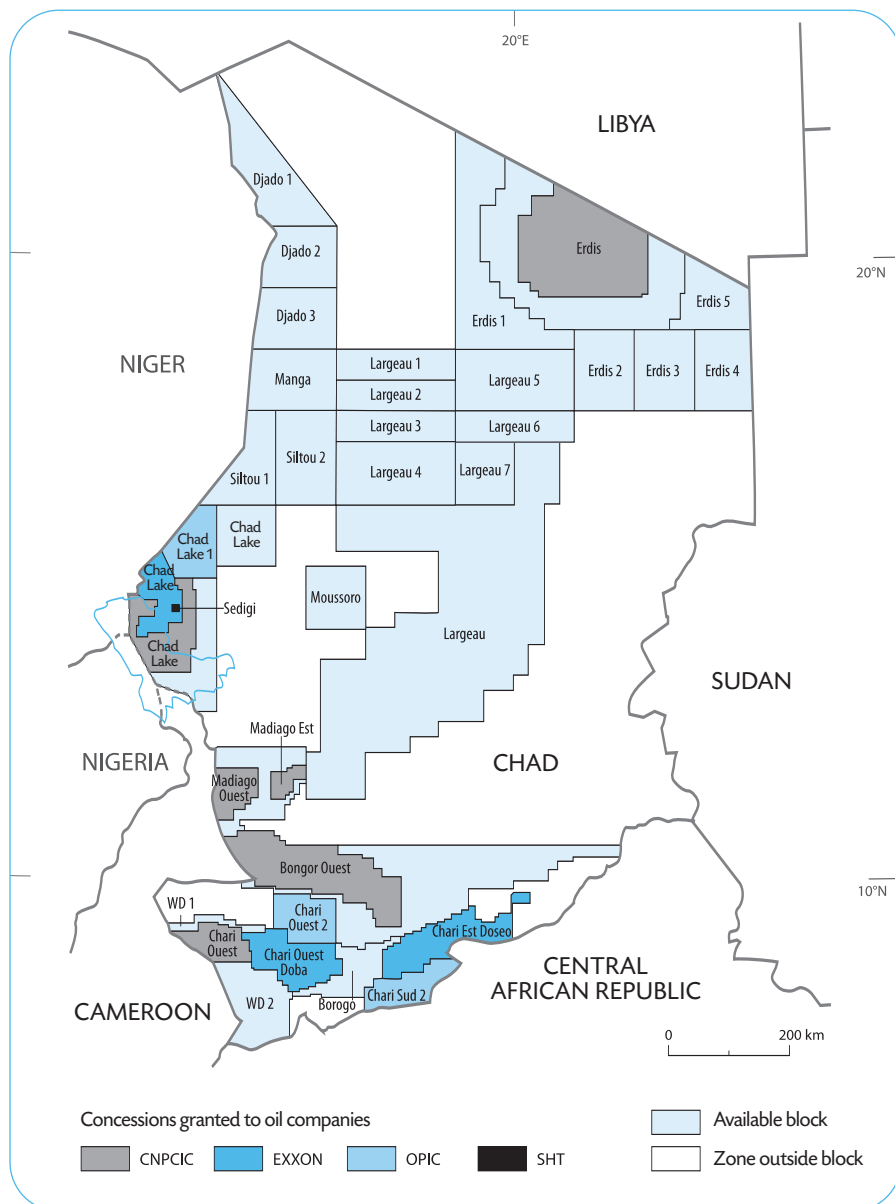
surveys conducted during the 2000s in the centre-west of Chad (Lake and Bongor Basin).^[89] Under this agreement, exploitation rights were granted to Cliveden on 16 March 2001. Cliveden then sold a 50% stake to the Canadian firm, Encana International Chad Ltd, on 26 February 2002. In 2003, CNPC entered into a partnership with Encana. In 2006, it bought out Cliveden's stake (which owned 50% of the consortium) and went on to purchase Encana's shares in December 2006. On 12 January 2007, it acquired all of the permit H concession, giving birth to CNPCIC (Maoundonodji, 2009:417; SHT, 2009*b*).

Geographically, the areas covered by the said permit H were divided into three zones (see Map 3): the North (Erdis), Lake Chad, and a somewhat fragmented southern zone to the north and west of Exxon's Doba concession (Madiago, Bongor to the north; Western Chari to the west). The zones cover about 22 million hectares.

Along with the Encana permit, CNPCIC inherited the results of the recent exploration surveys, as well as the information produced within the framework of the EIAs systematically undertaken by Encana during its exploratory drilling^[90] (see, for instance, Rémuzat, 2004; ENCANA, 2006). As a result of these processes, the inhabitants in the affected areas became used to receiving information and compensation. During the two years of joint work, CNPC was able to familiarise itself with Encana's environmental approaches, and also took over most of the latter's HSE personnel in 2007.

[89] The Erdis Basin, on the Libyan border, also fell under the same permit, but does not seem to have been subject to any substantial exploration, undoubtedly due to its distance from the centre of Chad and its high geopolitical sensitivity (it is close to the Aouzou strip – the theatre of the Chad-Libya wars in the 1980s).

[90] Which Exxon did not do.

Map 3 *Petroleum blocks in Chad in 2008*


Source: Petroleum Ministry, Chad (2008).

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3.2.2. Contours of the Rônier project

Rônier is an innovative oil project but comparatively modest in size producing 20,000 to 60,000 barrels a day to supply a small refinery located to the north of N'Djamena via an oil pipeline about 300 km long.

The Rônier project was set up within the framework of a global cooperation agreement between Chad and China, dating back to January 2007, and further defined in September 2007 with regard to the refinery. Chad, through the SHT, is a 40% shareholder of the *Société de raffinage de N'Djamena* (SRN – N'Djamena Refining Corporation) – established to manage the refinery – with the remaining 60% held by CNPCIC. It is the latter that provides the entire investment necessary for the development of the oilfields and the construction of the oil pipeline. The project's cost is currently estimated at USD 1 billion, of which half is for the construction of the refinery and the other half for the development of the oilfields and transportation system. On 18 July 2008, an electricity purchase contract was signed between the Ministry of Mining and Energy and CNPCIC, then on 4 December, the memorandum of understanding was signed allowing the SHT entry into the permit H concession for the exploration and development of the Bongor basin, and 10% of the consortium's shares.

The project thus has three components: ^[91] the oilfields, the oil pipeline and the refinery. The aim, initially, is to develop about 80 oil wells in the Rônier 1, Rônier 4, Rônier C1 and Mimosa 4 oilfields – close to the village of Koud Alwa, about 20 km as the crow flies to the south of the small town of Bousso.

According to Huang Youg Zhang, the CNPCIC Vice President, the Rônier and Mimosa oilfields can supply 1 million tonnes per year during the first production phase, but this could rise to about 3 million tonnes per year in the second phase. ^[92] The refinery is designed to process 2.5 million tonnes of crude oil per year. Phase I of the project ^[93] has an annual refining capacity of 1 million tonnes of crude oil. In addition

[91] Regarding institutional financing and structures, a distinction must be made between the oilfields and pipeline on one hand, managed by CNPCIC from its own funds, and on the other, the refinery, managed by the SRN, with Eximbank funding.

[92] The Republic of Chad's presidential office's website, consulted on 11 November 2010.

[93] The project was presented very plausibly as a development opportunity for Chad. In fact, the refinery was intended to facilitate the integration of inexpensive finished goods into the local market, to promote the domestic consumption of butane and electricity at tariffs that would make them substitutes for firewood (excessive use of firewood was exacerbating desertification), and also to substantially reduce KWh prices. Its delivery, planned for June 2011, was to allow Chad to eventually ensure its energy autonomy and possibly export finished goods.

to meeting the refinery's oil energy needs, the autonomous power station (with a 20 megawatt capacity) will supply electricity to the city of N'Djamena.

In order to do this, an operation centre, pumping and collection stations, a landing strip, access roads, a permanent living base, provisional camps for the construction phase, as well as a storage area and a power supply system had to be developed (ISM Consult, 2009b). Next, the deposits had to be connected to the refinery by a 311 km oil pipeline running in a south-east/north-west direction, crossing the River Chari and then following its right bank, which has no major relief features, until it reaches the flood plains bordering N'Djamena to the north. The pipeline's construction called for the occupation of 1,000 hectares of land, of which 90% were to be later returned to their occupants once the works were finished and the oil pipeline buried (*ibid.*). The Djermaya refinery^[94] will produce various oil products^[95] to supply an industrial zone whose size and activities are not yet known.

3.2.3. *The host environment: a Chadian transit zone*

The various components of the Rônier project cover natural and human environments that are fairly representative of Chad's geographic diversity; they are not however the most environmentally and socio-politically sensitive areas.

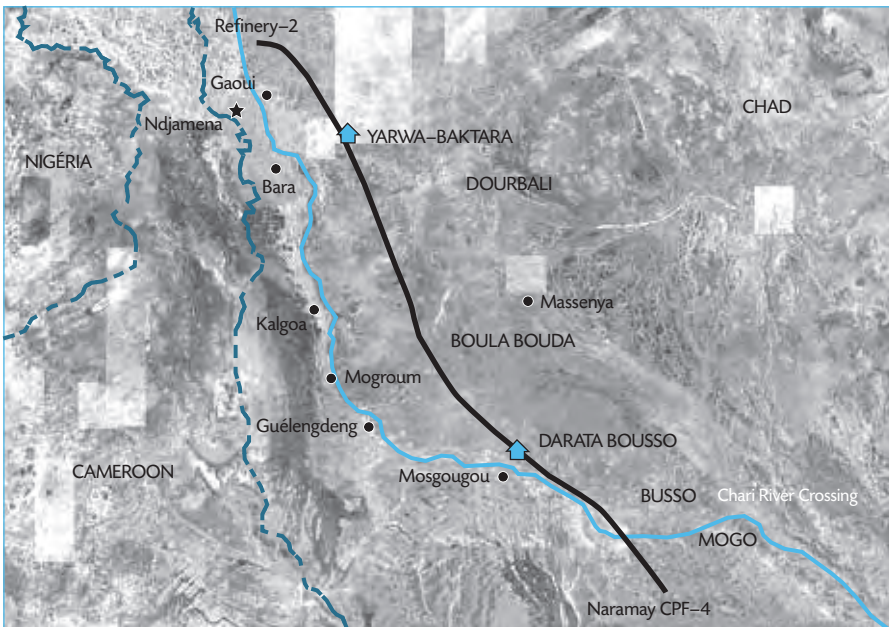
From the oilfields to the refinery, the project infrastructure crosses four types of milieu (ISM Consult, 2009a; see Maps 4 and 6 and Photos 6, 7 and 8): the oilfields are located in the Chari-Logone interfluvium, a North Sudanian wooded savannah region still relatively sparsely populated. The pipeline then crosses the Chari Valley – the Baguirmi Kingdom's old geopolitical border – which, since the 1970s droughts, has become a point of convergence for a diversity of populations (farmers and fishermen) and an area of transhumance for Peul and Arab herders. Biodiversity is relatively rich around the Chari and its tributaries and streams (fish, hippopotami, birds, etc.). The route then crosses the forests of western Baguirmi, with vegetation cover gradually thinning out towards the north. The region's human settlement is uneven, but overall moderately populated. Settlement patterns differ and reflect the depth of the aquifer and the accessibility of water, with clusters of large villages between the Chari's banks

[94] Equipped with a central power plant, a public works system, the refinery comprises units for atmospheric distillation, heavy oil catalysis, catalytic reforming, hydrofining, gas fractionation, propylene recovery, polypropylene production and product purification.

[95] During the first phase, the refinery is due to produce 700,000 tonnes of gasoline and diesel, 20,000 tonnes of kerosene, 25,000 tonnes of polypropylene, 60,000 tonnes of liquefied petroleum gas (LPG) and 40,000 tonnes of fuel oil.

and small scattered hamlets in the areas more to the north. The route taken by the pipeline avoids most of the larger villages. The dense, sparsely populated forests of southwest Baguirmi, around the River Bahr Erguig, are still rich in Sahelo-Sudanian wildlife (antelopes, elephants). More to the north, west of Dourbali, the impact of N'Djamena can be seen in the degradation of the vegetation cover. Vast acacia (gum tree) plantations are also found. Finally, to the north of Yarwa Baktaba, the pipeline approaches a moderately populated floodplain, where clay soils and sparse vegetation cover favour the cultivation of sorghum (*bérbéré*) transplants during the dry season.

Map 4 The Rônier pipeline route to the Djermaya refinery



Source: CNPC.

★ Capital ● Other localities ▲ CNPC bases

In the Chadian setting, the areas traversed by the pipeline seem to be moderately sensitive from an ecological, socio-economic and political standpoint. There are no protected areas or extremely vulnerable areas carrying a very high environmental value, as would be the case for Lake Chad, for instance. The pipeline does however cross the River Chari, which is a major tributary of the Lake. The Chari valley's water resources and aquifers mean that many population settlements are downstream from the pipeline's crossing point (including N'Djamena, the capital, with about one million inhabitants); any major pollution incident at this point would thus have considerable consequences. Likewise, the northern floodplains, around the Djermaya refinery seem relatively vulnerable to pollution, as floods are likely to transport the various substances contained in possible spills. Finally, the west Baguirmi forests also harbour a wealth of wildlife, which, although now a pale reflection of what it used to be (having been greatly damaged by the armed conflicts), is still sufficiently abundant to pose an environmental management issue for an industrial venture such as the Rônier project.

The areas concerned by the Rônier project again appear to be moderately fragile from the point of view of the rural economy. This is dominated by extensive farming and herding, with fishing along the Chari valley. The vulnerability of the Sahelian areas to rainfall variability inevitably creates a precarious situation for food security, depending on the year and social group concerned. Yet, on the whole, thanks to the fertile soils, the possibility of diversifying sources of income (fishing and market gardening along the Chari, gum trees to the west of Dourbali, or *berbéré* in the floodplain) and the proximity of the urban market in N'Djamena, these areas seem relatively advantaged compared to the rest of Chad's Sahelian region.

Finally, from the geopolitical standpoint, the Rônier project's host area seems more like a transition zone in which cosmopolitan populations converge than an area of identity-related tensions – unlike the Doba project's host area, for instance.^[96] The Rônier project development area has no coherent political identity on the national scene. At the local level, competition for land resources and the coexistence of farming and herding do lead to some conflict, but this has so far been fairly well regulated by the customary authorities. Nevertheless, this does not preclude possible tensions in connection with the project.

[96] Doba's oilfields lie at the heart of one of the areas affected by the "Southern" rebellions of the 1980s-1990s (see Magrin, 2001). Ngarledji Yorongar, one of the government's most vehement political opponents and the MP for the small town of Bébédja, located close to the deposits, was often dubbed by the national press as "the 301-well MP".

Photos

6, 7 and 8

*The Rônier project's host area:
a Sudano-Sahelian transect*

6 / The Chari riverbanks at the pipeline crossing point



7 / Shrub savannah (Acacia seyal gum trees) close to Yarwa Baktaba



8 / Berbéré floodplain not far from Djermaya



Photo credit: Géraud Magrin

Box 2 *Local populations still not very organised regarding petroleum issues*

Prospecting around the Rônier oilfields has familiarised the inhabitants with petroleum-related activities (Photo 9), but a strong asymmetry remains between rural Sahelian societies and the world's fifth-largest oil company (Photo10). This gap is all the more visible since civil society in the Rônier project area is still not very well structured (Photo 11).

Photo 9 *Young Peul inhabitant from the Rônier oilfields wearing boots probably from Encana or CNPC*

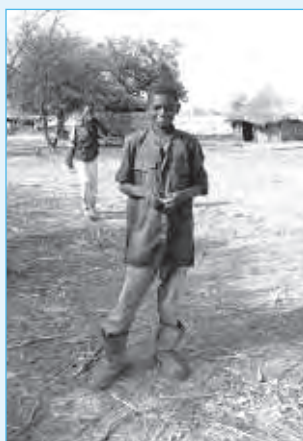


Photo credit: Géraud Magrin, April 2009.

Photo 10 *Villager next to the Djermaya refinery's foundation stone*



Photo credit: Géraud Magrin, November 2008.

...

...

Photo 11 *Board of the CROSCAP, one of the main organisations in Bousso*



Photo credit: Romain Dittgen, July 2010.

Moreover, the project name chosen by Chadian government at the end of 2009 indicates a degree of caution. The choice fell on the name given to most of the first exploratory oil wells to go on stream (Rônier 1, Rônier 4, Rônier C1... and Mimosa 4),^[97] and not that of a city or region. The Exxon project had been identified with the closest administrative centre, Doba. The government seems to have wanted to proceed differently in this case and avoid a name like “the Bongor project” or “the Bousso project”, for instance, which could instigate regionalist claims by inhabitants wishing to profit from the use of “their” oil.

In fact, in socio-political terms, the most sensitive areas for the Rônier and Doba projects are at different points. For Doba, it was the source of oil – in other words, the oil well zone and the smaller towns close to Doba and Bébédja – that crystallised tensions. The reason for this is that the oil deposits were situated in a geopolitically

[97] The exploratory wells drilled by Encana all bear the names of Sahelo-Saharan trees (Baobab, Mimosa, Acacia and Ronier palm). In addition, the ronier palm (*Borassus aethiopum*) is doubtless one of the most emblematic trees in the Chari-Logone interfluve, a legacy of the former role this area played in providing refuge along one of the edges of the slave-trading Baguirmi Kingdom (see Seignobos, 1989).

sensitive area, which also had high population densities and thus a potentially large number of people likely to be “impacted” by the project. In the case of Rônier, the greatest risk of tension lies at the other end of the pipeline in the vicinity of the Djermaya refinery, and this for several reasons. Not only are the impacts in this area potentially greater (in terms of land taken over by the project, vehicle movements and industrial activities), but also Djermaya, a small town on the edge of Greater N’Djamena’s urban sprawl, has been earmarked as a future economic hub. As a result, it now seems to have become an arena where actors with considerable political clout and close to the seats of power are strategically positioning themselves to seize land opportunities. These strategies may well threaten the residents’ land rights, particularly those of the “autochthonous” Arabs.^[98]

3.3. The Rônier project in China’s and CNPC’s strategy

The Rônier project evidences the pragmatism governing the implementation of China’s investment strategy in Africa in the natural resources sector.

3.3.1. *China’s interest in African oil*

The Rônier project fits into the pattern of Sino-African relations, which fall into two main phases.

Between the 1960s and 1990s when the different African nations’ were fighting for independence, it was the political dimension that predominated (Alden and Alves, 2009). In the Cold War context, the People’s Republic of China first gave its support to these struggles. Its African policy was then partly influenced by the rivalry with Taiwan, within the framework of “pocketbook diplomacy”, whereby economic support was the price to be paid for political recognition. The 2000s marked a turning point characterised by the exceptional economic growth of continental China, which led it to reconsider its international relations. Taiwan, now recognised only by a small number of African States, became a secondary issue in China’s African strategy.

In 2002, China’s President Hu Jintao launched the country’s “going-out” policy, which was aimed at encouraging Chinese businesses to invest abroad. The objective was to put the liquidities accumulated through record exports to good use and to find employment for available human resources, but also to accelerate learning and,

[98] Alarming though still isolated accounts of resource persons native to this area deserve more in-depth investigation.

finally, to secure the supply of raw materials for national needs. Africa's natural resources, particularly oil, played an key role in this strategy – although oil still accounted for only a small part of China's investments in Africa.^[99]

China's oil policy in Africa is marked by its mercantile perspective and by the competitive push to establish a presence in one of the last-remaining playing fields in the international oil game (Copinschi and Christmas, 2005:30). Until 1994, China was a net oil exporter. In 2004, it became the world's second largest oil importer (Soares de Oliveira, 2008:88), and caught up with the United States in 2010. From the end of the 1990s, the Chinese government has ensured the development of the national oil companies, which are responsible for the entire oil chain from exploration to distribution, including production, transportation and processing (see Part 1 and Soares de Oliveira, 2008:85). China's mercantile approach to the oil sector is grounded in its mistrust of markets and market instability (economic and geopolitical). As a safeguard, China avoids sourcing a large part of its supplies on international markets and prefers to control resources through its own national oil companies. To this end, it has invested in strong, friendly bilateral relations with oil-producing countries (ibid.:89).

Access to Africa's oil resources has been achieved through the original strategy of investing in regions left vacant by the Western majors. From 1995 in Sudan, CNPC has been the key operator of the Greater Nile Petroleum Operating Company, in a consortium with Talisman and Petronas, taking advantage of the embargo that kept international majors away. Sudan has served as the testing ground for a strategy that was later implemented in several countries (Nigeria, Angola, Equatorial Guinea, etc.). The strategy basically involves signing comprehensive agreements (package deals) that place oil contracts within a broader cooperation framework that includes aid, lines of credit and funding for various infrastructure projects such as roads, railways, ports, stadiums, refineries, etc. (Soares de Oliveira, 2008:96; see also Foster *et al.*, 2009).

3.3.2. *Oil and China in Chad*

Today, oil plays a key role in Sino-Chadian relations.

In 2006, after a period of strained relations, China and Chad restored their diplomatic ties.^[100] Shortly after, CNPC acquired a stake in the Encana-led consortium, before going on to purchase all its shares the following year. While consolidating its position

[99] Seven per cent, according to Mr Huang Mingyuan, Economic and Commercial Counsellor at the Embassy of China in Chad.

[100] Chad recognised the People's Republic of China in 1972, then the Republic of China (Taiwan) between 1997 and 2006.

in Sudanese oil production, China simultaneously implemented two similar oil projects in Chad and Niger (see Part 5). This has reinforced its presence in oil-bearing Central Africa – which seems like a new province – still on a small scale but with considerable development potential. This contrasts with the Gulf of Guinea where the first-comers have established strong positions that are hard to challenge (Shell in Nigeria, Total in Gabon and Congo, Exxon in Equatorial Guinea, etc.).

In Chad, the Chinese oil project holds a flagship position – with the construction of a cement factory in Pala – in an overall strategy in line with the model developed in Sudan and elsewhere offering debt relief, grants and food donations, urban roadway funding and loans from the China Export-Import Bank (Eximbank) to finance Chad's participation in the refinery project, as well as a series of cooperation measures in other fields (biofuels, solar energy, farming, etc.).^[101] This package was estimated to be worth USD 80 million in 2007 (Reuters, 2007).^[102] In April 2011, discussions were held between the China Eximbank and the Chad government on the financing of an international airport in Djermaya close to the refinery and a railway line between North Cameroon and Sudan crossing through Chad (Xinhuanet, 2011).^[103]

The medium and long-term intentions of China and CPNC in Chad are not formulated in any detail; at least, no mention is made of them in the documents presenting the Rônier project (SHT, 2009a,b,c), which only give a description of the initial project phase. Nonetheless, several hypothesis can be made about the project in its current form: (i) it may be an end in itself or, in other words, a commercial venture with expectations of profit; (ii) it may be simply a preliminary phase, pending further developments in the exploitation of Chad's oil; or (iii) it may also be part of a more general strategy, in which oil is just one resource among others likely to be of interest to China, as for example, the uranium from Mayo-Kebbi.^[104]

Although the third possibility cannot be completely excluded, the second seems by far the most probable today. Certainly, the refinery will not be equipped to process all of planned production and this could well experience a sudden increase if the necessary transport infrastructure is built to bring on stream the other oil wells explored in the Bongor Basin (Mimosa, Baobab, etc.) and nearby basins. The Embassy of China made itself quite clear: the project is presented as part of a “win-win” logic,

[101] Meeting with Mr Huang Mingyuan, Ndjamen, June 2010.

[102] By way of comparison, official development assistance from the traditional Western funding agencies to Chad was estimated at CFAF 70 billion annually in 2009, i.e. USD 140 million.

[103] The railway line would link up the existing networks between Ngaoundéré (Cameroon) and Nyala (Sudan), passing through Moundou, Ndjamen and Abéché.

[104] Where exploratory studies have been carried out over a few months by a South African subsidiary of Areva.

whereby Chad gains the opportunity to reinforce its economic and industrial system (refinery, industrial zone), while China gains additional resources, which of course means exporting them.^[105] In the first half of 2010, CNPCIC's senior managers went to the Doba site several times to visit the facilities. Talks were engaged with Exxon Chad management with a view to CNPCIC's acquisition of the (Doba) satellite fields, Krim Krim and Mangara, which produce around 20,000 barrels a day and are already linked to the Doba pipeline. An extension could connect the Rônier oilfields to the Doba pipeline via Krim Krim, in which case only a 50-100 km pipeline would be necessary (depending on the route selected). CNPCIC would thus have a relatively inexpensive means of exporting the production from its Chadian oil wells, while Exxon would be able to amortise its investment more rapidly, as currently only half of the capacity is being used due to a fall-off in the Doba oil production.^[106] An eventual connection between the Doba pipeline and the Bongor Basin to allow oil export had apparently been envisaged by the World Bank and Exxon when the project was originally sized. The possibility of the Rônier oil wells being operated by a Chinese company had in fact been mentioned by the *New York Times* at the time the Sino-Chadian agreement was signed in January 2007. Apart from the financial terms, any such connection will mean that agreement must be reached on how the different systems of norms standards are to converge (see Part 4).

Chad's oil prospects thus hinge on future discoveries, the possibility of exporting production, and negotiations between the players in the oil game (Chadian government, CNPCIC and Exxon). Connecting the Rônier oil wells to the Doba pipeline seems both highly probable and feasible in a not too distant future. Alternatively, or additionally (if Chad's production were to increase beyond the Doba pipeline carrying capacity), the option of a pipeline between Chad and Sudan could also be envisaged. This infrastructure would facilitate exports to China via Port Sudan but would be rather costly, since the pipeline would need to cover about 1,400 km to reach the pipelines crossing Sudan's Kordofan region. It would also remain contingent on political developments in Sudan, where the creation of two separate States following the South's referendum on self-determination (January 2011) has failed to address all the uncertainties. Furthermore, the chequered history of relations between Sudan and Chad since the 1960s^[107]

[105] Discussion with Mr Huang Mingyuan, Ndjamen, June 2010.

[106] This corresponds to the production profile initially planned.

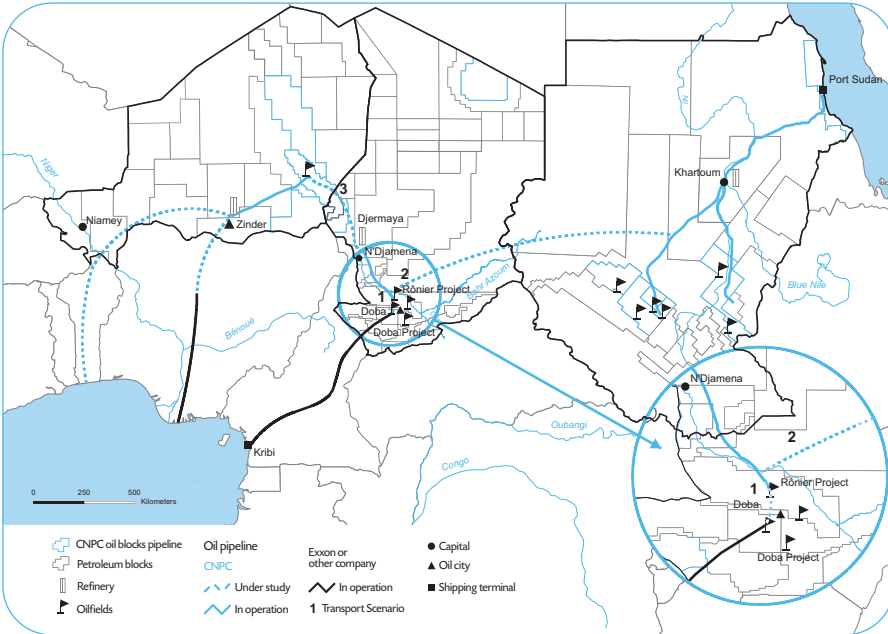
[107] The first major rebel movement in Chad, the *Front de libération nationale du Tchad* (FROLINAT – Chad National Liberation Front), was founded in Sudan in 1965. In 1990, Idriss Déby crossed from Sudan to chase Hissein Habré from power. During the 2000s, Chadian rebel movements supported by Khartoum were based in Darfur, from where two attacks were launched on Ndjamen in April 2006 and February 2008.

does not portend well for this route. Lastly, CNPC's oil project in eastern Niger, in prolongation of the Lake Chad deposits, seems to open up the possibility of a link to the southwest (see Part 5). The challenges involved are similar to those in Chad: a small refinery located 50 km from Zinder will be fed by a pipeline some 300 km long. It will absorb only part of the production and the surplus will have to be exported. But how? Through Nigeria? Benin? Chad? The first route would be shorter, but transiting through Nigeria would raise many problems. The second would be the safest, but also very long (Zinder is about 1,400 km from the Benin coast). The third route would potentially be the most cost-effective as the distance to be covered by the pipeline would be the shortest: 500-600 km as far as Djermaya, then 150-200 km from the Koud Alwa oilfields to the Doba pipeline. However, this would have major implications for production rules and would entail dovetailing standards with those of the Exxon pipeline (see Part 4).

Discussions between Chad and Eximbank for a railway line through Chad to link Ngaoundéré to Nyala echo the old dreams of using rail to disenclave the Chadian Basin, which had failed to materialise in the late 1950s (see Sautter, 1958). The economic underpinnings of such a project remain unclear as it is difficult to see what flows could ensure the cost-effectiveness of this type of infrastructure. But then it was perhaps no coincidence that these talks coincided with the negotiations on a possible connection between the CNPCIC's oilfields and the Chad-Cameroon pipeline: highly utopian projects to open up this landlocked country often resurface in such situations, as if their purpose was to bring down bidding prices by showing that other options (besides the ones being fiercely negotiated) are possible.^[108]

[108] Previously, during the negotiations between Chad and Cameroon on the Doba project, comparable chains of events could be seen – with the press reporting secret talks on a Congolese route as an alternative to the one running through Cameroon (Tulipe, 2004).

Map 5 Existing oil pipelines and transport scenarios for the new projects



Design: G. Magrin and R. Dittgen; Production: JF Cuenot.

Moreover, the option of CNPCIC purchasing the Doba permit along with the related facilities is not to be excluded in a somewhat nebulous medium-term perspective. Exxon could indeed decide to withdraw from a project that has more than paid for itself and made higher-than-expected profits, while the end of the project cycle is likely to bring environmental management problems. For the CNPCIC, the acquisition could prove worthwhile both in terms of access to resources and as a technological learning experience.

Whatever happens, for informed observers,^[109] CNPCIC today appears as a long-term oil partner for Chad not only because substantially larger oil reserves are likely to be developed, but also because the array of support actions implemented matches the country's priority needs.

[109] Meeting with Soumaine Adour, Oxfam, N'djamena, July 2010.

3.4. Importance of the Rônier project for Chad

The Rônier project represents important stakes for Chad as it can help to expand the country's margin of manoeuvre vis-à-vis its traditional Western partners and to boost and diversify its economy, while enabling national stakeholders to deepen their learning experiences.

3.4.1. *Greater room for manoeuvre*

Geopolitical contingencies have influenced the current situation: the entanglement of the Sudanese and Chadian politico-military crises in the mid-2000s and Sudan's backing of Chadian rebellions seem to have been the driving force in the renewal of diplomatic relations between Chad and the People's Republic of China. In fact, the good relations between China and Sudan had helped to strengthen Khartoum, which posed a danger for Chad.^[110] As a result, three months after an armed rebel column from Sudan had failed to seize power in N'Djamena, Chad renewed its relations with China (Maoundonodji, 2009:404). This new alliance was all the more important as Chad's relations with the World Bank and the oil consortium had come under strain (Pegg, 2009).

The Rônier project thus has relational implications for Chad: China's presence reinforces Chad's negotiating positions, be it with Western donors (World Bank among others; IAG, 2010) or with the Exxon-led consortium. For example, the thrust of the talks on Exxon's gas-flaring in Doba seems to have changed in recent months and the practice of gas flaring has changed. Chad has been making repeated demands with respect to gas-flaring since operations began and, in recent months, it seems that more gas is being used to generate electricity, while the volumes burnt have decreased. Yet, more importantly, the Chinese presence appears to have coincided with greater openness on this issue on the part the Doba consortium.^[111]

3.4.2. *Diversifying the economy with hydrocarbons?*

The Rônier project could impact Chad's national economy in two ways: its first phase could boost development by creating links between the petroleum sector and other areas of activity, which, ultimately, should also increase the State's oil rent.

[110] The issue of the Darfur conflict within this diplomatic rapprochement, and France's role in facilitating it, were confirmed by Mr Bruno Foucher, Ambassador of France to Chad (meeting in Ndjamena, December 2010).

[111] Discussion with a top-ranking official from Chad's Ministry of Mines and Energy, August 2010.

The energy burden has long been one of the major obstacles blocking Chad's development path. Due to the country's landlocked position, to the setbacks experienced by the Nigerian refineries and to the difficulties in managing the energy sector, Chad's energy is not only among the costliest in the world but also among the least available (only four or five cities^[112] have a relatively regular power supply, albeit with very frequent outages). Occasional interruptions in fuel supplies also disrupt the economy. The structural energy shortage has a deeply negative impact on productive activities – on the country's embryonic industrial fabric^[113] as well as its craft industry (see Magrin, 2001 and 2007). Squeezed by deficits and debt, the *Société tchadienne d'eau et d'électricité* (STEE – Chad's Water and Electricity Company) has for years been unable to make the investments crucially needed to meet the growing energy demands. Yet, its privatisation has always been avoided, given that it is the seat of highly sensitive vested interests that could not survive a change in management methods.^[114] Chad's leaders have long been trying to find a way around this constraint. The idea of building a refinery to process light oil from a small deposit in the Kanem region (Sédigui) had thus taken root as far back as the late 1970s (Maoundonodji, 2009:246). At the end of the 1990s, the Chadian government and the World Bank succeeded in imposing the idea of coupling the Doba and Sédigui projects. The production in the south was earmarked for export, while the Sédigui production would go to a small-scale refinery, to be built in Farcha in N'Djamena's inner suburbs, and feed into the domestic market. However, when Elf and Shell withdrew from the consortium in 1999, the plan was compromised: given the government's fears of seeing the oil dream vanish yet again (cf. Part 2), the new consortium created shortly after (Exxon-Chevron-Petronas) found itself in a strong enough position to obtain the separation of the two projects, and it subsequently abandoned its interest in the Lake oil reserves. The Sédigui project was then awarded to a Sudanese company, CONCORP, whose senior management had long-standing ties with various Chadian officials. However, the company had no experience in the oil sector and the pipeline under construction^[115] had so many defects that works had to be abandoned (Tulipe, 2004). The company manager was

[112] In addition to the capital Ndjamena, Moundou, Sarh and Abéché have also had access to local power grids for many years, but their production capacity is far from sufficient given rising demands. Faya Largeau, Bongor and Doba have recently been equipped with power plants, but electricity supply there is very rare. The grids are not interconnected.

[113] In particular, the *Société tchadienne des textiles* (STT – Chadian Textile Company), which operated in Sarh from the 1970s to the end of the 1990s, fell victim to energy prices, as Nigerian imports were far more competitive (Magrin, 2001).

[114] In May 2010, the STEE's water and electricity businesses were separated, giving birth to the *Société tchadienne des eaux* (STE – Chadian Water Corporation) and the *Société nationale d'électricité* (SNE – National Electricity Company). But this change did not have an immediate effect on the malfunctions of the departments concerned.

[115] The non-buried pipes are still visible on the sands of the Tourba Massakory or Ngouri Bol tracks.

murdered shortly after. Although the Doba project was implemented within a very short timeframe, the ambition of producing oil to meet the needs of the domestic market again seemed out of reach.

The Rônier project has thus revived the prospect of directly using oil resources^[116] to further national economic development. The spinoffs from the initial construction phase were to be limited compared to the spinoffs generated by the construction of the Doba facilities. In the producing region,^[117] as well as in N'Djamena, the Doba project had had its strongest direct impact on the national economy during its initial phase. Yet, these had failed to deter local resentment (from businesses and job applicants) as the Chadian context was still largely dominated by an informal economy and low-skilled labour and the consortium had thus had to mobilise mainly foreign, international or regional skilled human resources (sub-contractors, skilled personnel; Magrin, 2003). The Rônier project's more modest scale, along with the partners' determination (Government of Chad and CNPCIC) to complete it within a very tight deadline, have thus necessitated recourse to Chinese subcontractors for the most part. Local job and business opportunities exist, but they are narrow (see Part 4). Finally, the Djouman-Gam-Rônier road, built for delivery of supplies to the construction works, will partially open up the areas it traverses, through to the Koud Alwa oil well zone.

In this case, the results of production start-up could lead to more positive effects for the national economy. At the macroeconomic level, the refinery should help to cut foreign currency spending on product imports and increase energy independence. To this end, the crude will supply a thermal power plant producing 40 MWh, half of which is for the refinery's operation and the other half (20 MWh) for the STEE on terms still to be defined. This will not be enough to resolve the structural problems of supplying energy to a capital city with current consumption of around 100 MWh, but will nonetheless serve to ease a saturated electricity grid until longer-term solutions are found. If the industrial activities based on the refinery are successful, Chad's economy would be enhanced by a wide range of oil products. The development of gas should also contribute to the fight against desertification (SHT, 2008) as it can replace wood or coal consumption in urban areas. Eventually, petroleum products will hopefully be available on a more regular basis and at more attractive prices than at present, thus reducing the current dependency on Nigerian imports, which are liable to

[116] The Doba project provides the State with rent linked to the export of a raw material, which, like any other rent, has the disadvantage of being disconnected from the national economy's productive sectors (Magrin and van Vliet, 2009).

[117] In a broader sense, as under the terms of the loan agreement with the World Bank, this in fact covers the former geographic region of Logone (West and East Logone, Tandjilé and Mandoul regions).

disruptions and price variations – and this could promote more stable economic and environmental policies

The profile of the activities in the planned industrial zone adjacent to the refinery is crucially important. Mention has been made of petrochemical activities (manufacturing of plastic objects), as well as gas-conditioning units, though no details have been provided so far. The zone's development requires in-depth dialogue with national stakeholders (for example, through the N'Djamena Chamber of Commerce and Industry) to ensure that the choices made are economically viable and produce the most beneficial ripple effects for Chadian operators. In Chad, as elsewhere in Africa, transforming skilled tradespeople into modern industrialists is one of the major challenges of the development enigma (Grégoire and Labazée, 1993). Moreover, the setting up of this embryonic industrial zone around the refinery could usefully serve to explore the ways in which Chad can engage on the path towards the energy transitions that are likely to occur in the twenty-first century: the oil economy could help the country escape of supremacy of fossil fuels. International cooperation, whether Chinese or European, could for example be asked to provide expertise and help set up a solar panel factory.

3.4.3. *Continuing along the learning path*

The Rônier project also gives Chadian actors the opportunity to continue the learning experiences that first began under the Doba project.

This involves the public sector, where SHT's institutional and technical capacities need to be increased, relations with the Ministry of Petroleum clarified and the State's environmental monitoring functions strengthened, particularly *via* the CTNSC (see Part 2). In the upcoming phases of the current Rônier project, the oil rent will increase due to the export of crude. To what extent remains an unknown. But the challenges now are to improve governance so as to stave off any adverse effects on institutions and the economy (Rosser, 2006). With the CCSRP, Chad has shown itself to be a pioneer in the field of oil transparency. Certainly, to foster development, transparency must not only cover upstream functioning, with publication of the amounts paid by oil companies to the States concerned (a key focus for the Extractive Industries Transparency Initiatives (EITI) and the Publish What You Pay network,^[118] see Magrin

[118] EITI, launched by the British government in 2003, seeks transparency commitments from States and extractive companies, in particular the commitment to disclose the amounts the companies pay to the governments for the permits to exploit natural resources. Publish What You Pay is a civil society network that, in each member country, federates an NGO coalition around very similar objectives. See <http://publishwhatyoupay.org/fr/about/propos-de-pcqvp>.

and van Vliet, 2009); it must also cover downstream aspects or, in other words, how the oil rent is distributed and managed by the State. Despite the difficulties encountered (Pegg, 2009; ICG, 2010), the constant discussions that have taken place in Chad on this question over the last ten years seem to signal a space for bifurcation (van Vliet and Magrin, 2009), which could usefully serve as an opportunity to consolidate what was achieved during the previous period.

But it also involves the other stakeholders, and notably those from civil society. The national organisations that have specialised in monitoring oil activities and advocacy work since the Doba project start-up – mainly GRAMPTC and the CPPN and CPPL networks – must now learn to evolve in a landscape very different from the one that existed when they were set up. With the World Bank's withdrawal, international media coverage of Chad's oil sector waned and a new balance now needs to be found between the old forms of advocacy and a deeper dialogue with the State and the oil company. This will be a difficult but nonetheless crucial task if they are to capitalise on what has been learnt through the Doba experience, with a view to enhancing governance – which is the only way of skirting round the pitfalls of the resource curse (Magrin and van Vliet, 2009).

In the areas involved in the Rônier project, local civil society has a long road ahead of it. The local organisations were fewer and less effective than their counterparts in the Sudanian zone of the Doba project. They also received no support from the World Bank or, indirectly, from the main international NGOs who were spurred by the involvement of this major international institution. The national NGOs and networks that grew out of the Doba experience are helping them to create their own networks, for example, through the *Collectif des réseaux et organisations de la société civile* (Collective of Civil Society Networks and Organisations), which is supporting the Loug Chari local communities (CROSCAP LC). The issues will be the now standard ones: defending the interests of local inhabitants and the environment against the impacts of industrial activities (compensation for loss of land, accidents, pollution, etc.).

One important question is still unclear: how will the various regional impacts of the oil activities be compensated? The impacts go beyond those in the areas alongside the facilities, for which compensation is granted on either an individual basis (compensation in cash or kind for the loss of land, trees, houses, etc.) or a community basis (small-scale amenities for villages). They typically include phenomena such as inflation, increased traffic flows that damage roads, lead to accidents and disturb domestic or wild animals, etc. For Doba, the 1999 Petroleum Revenue Management Law had resolved this question by allocating 5% of the receipts to the oil-producing region of

East Logone. The representatives of the residents of affected areas (traditional chiefs, members of parliament, NGOs and sometimes government officials) are demanding a similar mechanism for the new project. But this raises new problems (ISM, 2009b): five per cent of what, since the oil will not be exported – at least, not initially? At the outset, two regions will be involved,^[119] but the expansion of the oil fields and their possible connection with the Doba export facilities will widen this geographic area to Tandjilé in East Mayo-Kebbi and to West Logone. The uncertainties hovering over the decentralisation process^[120] heighten the complexity of this problem. The challenge is to avoid the kind of negative fallouts seen in the Niger Delta, where the absence of positive spinoffs at regional level first created strong tensions and then, the remedial measures taken triggered a territorial fragmentation against a backdrop of a race for oil rents (Sébille-Lopez, 2009), rendering the national territory ungovernable.

3.5. Conclusion

The Rônier project reflects the meeting point between two national strategies: China's drive to diversify its oil supply sources in Africa, and Chad's ambition to expand its partnerships, particularly in the sector that has become central to its economy. The Rônier project, as currently operated, appears to carry manageable environmental risks: it is comparatively limited in size and the host environment presents only moderate levels of ecological, economical and geopolitical vulnerability. Its positive and negative local impacts are likely to be much weaker than Doba's – because the project, less publicised by the media, gives rise to fewer hopes and less migration, but it also creates fewer jobs and business opportunities.

Once on stream, the Rônier project will supply a small amount of energy to N'Djamena but, above all, it will encourage a more diversified national economy through the manufacture of petroleum products. In a second phase, it could support the creation of a petrochemical sector in the industrial zone planned near the Djermaya refinery and boost national oil rent, if oil production in the Bongor Basin can be stepped up by connecting the fields to Doba's export infrastructure.

[119] The Chari Baguirmi region hosts the Rônier oilfields and most of the pipeline route; the end of the pipeline and the refinery are located in the Hadjer Lamis region.

[120] The 1996 Constitution established Chad as a unitary decentralised republic. Mainly due to the politico-military unrest experienced by the country during the 1990s and 2000s, no local elections have as yet been held. Since 1999, several waves of territorial demarcation have taken place (new departments, sub-prefectures, etc.).

For CNPC and Chad alike, this is a second step in the contemporary African petroleum experience. For both partners, the project carries important stakes, for instance, in terms of increasing resources (oil for China, financial resources for Chad) but also strengthening their learning curve. For CNPCIC, this involves capitalising on its Sudanese experience as well as the Encana or Exxon legacies in order to develop a composite oil project (combining exports and local processing) that complies with international standards in the setting of an African LDC. For Chad's government and civil society, the challenge is to consolidate what was achieved in the previous period with respect to institutional and financial management, environmental regulation and a dialogue between civil society and the State.

The most challenging questions relate to how the refinery and the projects planned downstream (industrial zone) will be developed. Without a feasibility study, their economic viability still has to be demonstrated and future environmental risks could exceed those that already perceptible depending on the type of activities in the industrial zone, the expansion of the oilfields and the route taken by the pipeline. The future of these developments and of oil revenue management will depend on the choices made by the Chadian public authorities. They may choose to deepen the experiences of dialogue started ten years ago around the Doba project, or else choose closure and continue to distribute and use the oil rent in ways that do not drive development (Magrin, 2011). The seeming pragmatism of CNPCIC's relations with the host country, especially in the area of environmental regulation, appears to indicate that the company would be equally satisfied with either option.

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Part Four

4. CNPC's HSE system put to the test in Chad

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4.1. Introduction

The CNPC group was created in 1988 following the restructuring of the Ministry of Petroleum of the People's Republic of China. Prior to this reorganisation, there had been strict guidelines governing how the oil sector's upstream and downstream activities as well as the geographies (east or north, China or overseas) were allocated among the state-owned oil companies. The 1988 reform swept away these rigidities and introduced the principle of competition between public corporations in order to boost oil production and meet the rising demands of the national economy. Against this background, CNPC gradually expanded its oil exploration activities to include oil refining, technical services and equipment manufacturing. Faced with declining national production, it also ventured beyond the nation's frontiers to engage in global expansion (Jiang and Sinton, 2011), a move backed by the Chinese government's "going-out" policy and by preferential access to credit. The company has thus become China's leading investor overseas. In 2009, CNPC was ranked fifth among the world's top oil companies (CNPC, 2009a). It had set up 81 oil and gas projects across more than 29 countries worldwide (*ibid.*), contributing to an external oil production of 70 million tonnes, equivalent to 37% of China's crude oil imports in 2009 (*ibid.*). In overseas operations, CNPC has gradually established its dominance over the other two Chinese state-owned companies, the Sinopec Group and the CNOC Group, at times engaging in direct competition with them (see Liou, 2009). In 2009, the company accounted for 49% of the country's overseas oil production and 67% of overseas gas production (CNPC, 2009a; Liang *et al.*, 2010).

Since 1997, when the first HSE system was designed,^[121] the CNPC has been constantly revising it to bring it up to international standards (Du, 2005). However, the rapid expansion of its operations has been marred by a series of accidents, causing heavy human and material losses and/or environmental disasters (Liang *et al.*, 2010). These accidents, listed in Box 3 (non-exhaustive list) have tarnished the image of CNPC, its subsidiaries and sub-contractor companies.

Box 3 *Examples of accidents on sites managed by CNPC or its subsidiaries (2003-2010)*

December 2003: 243 dead following a gas pipeline explosion in Kai County (Chongqing municipality).

November 2005: Explosion of a petrochemical plant, managed by a CNPC subsidiary company in Jilin province, that killed 8 people and severely contaminated and polluted Songhua River and its drinking water, affecting millions of users in China and Russia.

December 2009: An oil spill from the CNPC oil pipeline at Chishui (Shaanxi province) polluted the Yellow River.

January 2010: Petrochemical plant explosion near the town of Lanzhou (Gansu province).

July 2010: The explosion of an oil pipeline run by the CNPC near the town of Dalian (Liaoning province) caused a massive fire and a large oil spill in the Bohai Sea.

September 2010: CNPC oil refinery fire near the town of Fushun (Liaoning province).

Source: Liang et al., 2010.

These accidents have added to the constant pressure on CNPC, both in China as well as overseas, especially with regard to HSE issues. In order to restore its image in China and to ensure the continuation of its exploratory and production operations worldwide, CNPC has gradually developed an HSE system in-house. In 1997, it adopted the ISO 14001 standard for environmental management. It also provides many training opportunities with Western companies or with external HSE consultants as well as in-house training programmes. It has developed cleaner production procedures, adopted compensation mechanisms,^[122] demanded higher quality from equipment

[121] The environmental policy of extractive firms is usually formulated in an approach and tools called "HSE" (Health, Safety, Environment).

[122] Acting within the framework of a joint initiative with the State Forestry Agency and the China Green Foundation, CNPC has contributed towards the creation of a Green Carbon Fund, with a capital endowment of RMB 300 million (i.e. EUR 31.8 million), aimed at encouraging protection and reforestation activities.

suppliers and, finally, complied with increasingly strict standards (for emissions, waste, effluents, etc.). In 2007, the group's 217 member companies had obtained ISO 14001 (CNPC, 2009) certification. According to CNPC, the cleaner production approach prescribed at the national level has led to the development of new equipment and cleaner drilling procedures; it has promoted stricter compliance with environmental standards during oil pipeline installation, recycling of refinery effluents and waste matter, and the reduction of greenhouse gases. In 2008, more than 2,780 cleaner production sites were successfully completed (CNPC, 2007) and contamination levels were significantly lowered, especially sulphur dioxide emission levels (CNPC, 2009). Security guidelines have been put into place. In order to meet with HSE requirements in the Bohai Sea, CNPC has built an offshore emergency response and rescue centre for accidents at sea, which includes rescue systems, a fire-fighting plan, and the prevention and handling of oil spills. With regard to health issues, CNPC has adopted measures to reduce occupational accidents and diseases and improve working conditions in compliance with the Code of Occupational Disease Prevention. This strong commitment to set up HSE regulations and systems^[123] leads to the question of whether these measures are being enforced on the ground.

Although China's recent changes in environmental management have been the subject of numerous published reports, very few of them have focused on oil companies. Studies specifically dedicated to CNPC and its environmental management strategy overseas, especially in Least Developed Countries (LDCs) are even rarer. However, many studies have shed light on the behaviour of multinational Chinese companies operating overseas (Alden and Davies, 2006), the environmental footprint of Chinese investments particularly in Africa (Bosshard, 2008), and the specificities of SER approaches used by Chinese companies (Xu and yang, 2010). In addition, a study on HSE management in China's petroleum sector (Du, 2005) examines the history and development of the HSE system used by Chinese oil companies operating in China and overseas. Another study focusing on CNPC's HSE management system used in its operations overseas suggests that an independent management system should be set up to enable stricter environmental monitoring (Qi, 2007).^[124] The author's description of environmental management in CNODC (an overseas subsidiary of CNPC) is particularly relevant to the present chapter, as Qi shows that the "going-out" policy has increasingly exposed Chinese companies to the norms and standards of their host

[123] CNPCInt/CNODC, meeting with the engineers Tian Wenhui and Zhao Qihzhi, Beijing, May 2010.

[124] Mr Qi Jinli has been the vice-manager of CNODC's HSE department since 2003. The report cited was written during the course of his Masters studies at UIBE in Beijing. He has (co)authored many articles on HSE management in oil companies in China.

countries (*ibid*). Ever since the petroleum sector opened up to foreign investments, CNPC has forged ties with Western oil companies. It has operated both as the lead company and associate partner in consortia and acted as a services and goods subcontractor or a user of third-party-managed petroleum infrastructure, as is likely to be the case with the Exxon pipeline project in Chad.

CNPC's Chad operations centre on the permit H, ^[125] for which it has been the sole operator since it acquired the stakes of the Canadian group, Encana, on 12 January 2007. The permit covers geographically scattered basins, such as the Bongor Basin, which come under the Rônier project (Reuters, 2007). In July 2009, CNPC started the three-year construction phase for the petroleum infrastructure, which includes three types of facilities: production facilities on the four oilfields (Rônier 1, Rônier 4, Rônier C 1 and Mimosa 4), a 311 km pipeline and a refinery at Djermaya (a village 40 km north of N'Djamena).

In 2010, 100 wells were drilled. The Djouman-Gam-Rônier road built by CNPC is used to carry supplies to the oilfield sites and intended to partly open up isolated project areas. Surface engineering work at Rônier and on the pipeline was started in July 2009 (CNPC, 2009*b*). Horizontal drilling operations underneath the Chari River were carried out in December 2009 (CNPC, 2009*c*). Pumping and transport to the refinery began in June 2011.

The project's initial financial arrangements have implications for environmental regulation. Under the Chinese cooperation programme, the refinery was to be built through a joint venture between CNPC (60%) and SHT (40%), with the SHT contribution to be funded through an Eximbank loan. In the case of the Rônier oilfields and pipeline, CNPC was the sole investor. The influence of environmental conditions linked to the Eximbank loan would be worth examining.

The production outlook forecasts a surplus of crude oil compared to the refining capacity. The surplus would thus be exported, raising the question of the various transport options (see Part 3). The different options need to be fully weighed (the most likely option being transport *via* the Exxon-managed pipeline) as the choices made will have a decisive influence on the choice of reference environmental standards.

In fact, on its arrival in Chad, CNPC had to deal with various expectations regarding environmental management. The company had not only to comply with Chinese envi-

[125] This permit covers a surface area of 220,000 km² and covers part of the Lake Chad Basin, the Madiago Basin, the Bongor Basin, part of the basin bordering the Central African Republic and all of the Salamat Basin.

ronmental regulations and standards (see Part 1)^[126] but also keep its environmental management in line with the ISO 14000 international standard. While environmental regulation is certainly more developed in China than in Chad, Chad had acquired a singular experience in the oil sector through the Exxon-Doba project. Backed by the World Bank in its early stages, this project had instituted a series of environmental procedures and standards – some highly sophisticated,^[127] others pragmatic and innovative – that were most often enforced and regularly monitored. For Chad, this project had been a ground-breaking experience (see Part 2).

In this chapter, we will address the following specific questions: what environmental norms and standards regulate CNPC's operations in Chad within the Rônier project? Are these clearly stated and complied with in practice? How are the impacts, notably cumulative ones, anticipated and dealt with? What are CNPC's major challenges regarding its interactions with the host environment in Chad and its future interactions with the Exxon-Doba project?

To answer these questions, the following hypotheses need to be tested:

- The reference standards followed by CNPC for environmental regulation comprises norms and standards from diverse sources (China, international level, host country).
- Eximbank's involvement in the co-financing of the "refinery" component helps to ensure compliance with Chinese regulatory norms on EIA.
- Although present impacts are moderate, cumulative impacts (especially when future activities are taken into account) may constitute major issues that are currently underestimated.
- In Chad, CNPC's lack of capacity to engage in dialogue with stakeholders from outside the company can be explained by the situation prevailing in its home country (in China, the State decides on environmental matters), but above all by the fact that the company's HSE procedures and technical specifications do not provide for dialogue.

[126] Environmental Impact Assessment Law of China adopted on 28 October 2002.

[127] Law No. 6/PR/007 of 2 February 2007 relating to hydrocarbons; refer to CEFOD, 2006

These hypotheses will be examined from several angles, starting with the frame of reference chosen by CNPC and the Chadian government. We will show the composite nature of this reference (section 4.2), then review the environmental commitments made by CNPC and show how these form an integrated HSE system. We will explore the consequences of the legal grey area created by the reference to the Chinese EIA Law. We will also try to understand the reasons why the refinery is dealt with separately from the oilfield and pipeline in the EIA report (section 4.3). The way in which the first impacts have been managed will be studied (section 4.4), as will the challenges posed by future cumulative impacts that were inadequately taken into account in initial EIA reports (section 4.5). The possible access to the Exxon-run Chad-Cameroon pipeline raises the question of compatibility between the different HSE approaches. Drawing on a comparative study between the CNPC and Exxon HSE systems, we will return to the lack of dialogue characteristic of CNPC's approach. Finally we will compare the Exxon and CNPC HSE systems in order to analyse the challenges raised by their possible interconnection (section 4.6).

These studies draw upon our knowledge and field experience, a survey of the literature (more particularly the draft version of the EIA on the pipeline and oilfield, authored by ISM Consult), discussions and summaries of the work carried out with the stakeholders of Chad's petroleum sector, as well as our observations during the field trips to Doba, Rônier and Djermaya between June and September 2010.

4.2. A composite frame of reference for environmental standards

The usual practice in petroleum contracts is for signatories to agree on the reference norms and standards to be applied during project execution, whether these relate to technical, environmental or other domains.^[128] According to the resource people we interviewed and the available data,^[129] the contract signed between CNPC, the Chinese government and the Chadian government stipulates that Chinese legislation and industrial standards will serve as the frame of reference for the technical and environmental norms and standards. Following the overall presentation in Part 1 of how environmental regulation developed in China, Part 4 will give a more detailed description of the reference norms and standards applicable to CNPC (irrespective of whether they have been issued by the State or by production-related entities).

[128] For instance, relating to social or fiscal matters, which are not dealt with here.

[129] The terms of the contract were not disclosed to the public.

In China, environmental norms and standards are produced by various administrations or industrial conglomerates, after validation by the government.^[130] They involve cross-sector governmental standards, sector-specific standards and standards regulating technical or environmental aspects. Their scope may be national, regional and even provincial or municipal. Industrial norms and standards are set by the state-owned oil companies themselves. They can cover the quality of materials and products, production methods and procedures (for instance, cleaner production) and all areas of HSE management, which is our focus here.

At the national level, the state standardisation administration (SAC) issues a set of standards, termed *Guo Biao* (GB),^[131] which are technical standards applicable country-wide. Emission standards are part of GB standards. In the 1980s,^[132] emission standards were issued specifically for the petroleum industry. However during the 1990s, these standards were replaced by overall emission standards. These set integrated emission limits on pollutants industry-wide^[133] or by sector. Until now, no new emission standards specifically intended for the petroleum industry have been issued. The SAC issued ISO standard equivalents for HSE management systems. For instance, the GB/T 24001 standard on "Environmental management systems – Requirements with guidance for use", published in 2004, is the Chinese equivalent of ISO standard 14001-2004 (SAC, 2004).

The SEPA, and then the MEP which replaced it, also issue technical standards called *Huan Jing* (HJ).^[134] For example, EIA's technical guidelines (HJ/T2.1-2.3-1993; HJ/T2.4-1995 HJ/T19-1997) and EIA's technical guideline for construction projects (HJ/T169-2004) were issued (SEPA, 2004) in order to implement the EIA Law of the People's Republic of China (2002) and the Regulation on the Environmental Management of Construction Projects (State Council, 1998). Two of these standards are specifically intended for the petroleum industry: the HJ/T89-2003 standard and the HJ/T 349-

[130] The difference sometimes evoked in OECD countries between public and private norms and standards is less relevant in China where environmental management remains primarily the responsibility of the government (see Part 1). This is even more the case in the petroleum sector, where operators belong to public conglomerates.

[131] *Guo Biao* means "national standard".

[132] The old petroleum emission standards: GB 3 550-1983, "Effluent standard for pollutants from the petroleum exploitation industry"; GB 3 551-1983, "Effluent standard for pollutants from petroleum refining industry"; GB 4 281-1984, "Effluent standard for pollutants from petroleum and chemical industry"; GB 4914-1985, "Effluent standard for oil-bearing waste from offshore petroleum development industry."

[133] Integrated emission standards are: GB 16 297-1996, "Integrated emission standard of air pollutants"; GB 8 978-1996, "Integrated wastewater discharge standard".

[134] *Huan Jing* means the "environment".

2007 standard provide technical guidelines for EIAs on petrochemical and on-shore oil exploration and production projects. Table 1 gives a list of environmental standards for the petroleum industry.

Table 1 *Basic environmental standards regulating the Chinese petroleum industry (partial list)*

	No.	Title in English
General	PHJ/T 2.1-1993	Technical guidelines for environmental impact assessment: General principles
	HJ/T 2.2-2008	Technical guidelines for environmental impact assessment: Atmospheric Environment
	HJ/T 2.3-1993	Technical guidelines for environmental impact assessment: Surface water environment
	HJ/T 2.4-1995	Technical guidelines for noise impact assessment
	GB 16297-1996	Integrated emission standard of air pollutants
	GB 8978-1996	Integrated wastewater discharge standard
Petroleum	HJ/T 19-1997	Technical guidelines for environmental impact assessment: Ecological environment of nature resource development
	HJ/T 125-2003	Cleaner production standard Petroleum refinery industry
	HJ/T 89-2003	Technical guidelines for environmental impact assessment: Constructional project of petrochemicals
	HJ/T 349-2007	Technical guidelines for environmental impact assessment: Constructional project of petroleum and natural gas development on land
	HJ/T 405-2007	Technical guideline for environmental Protection in Petroleum Refinery industry project for Check and Accept of Completed Construction Project
	HJ 443-2008	Cleaner production standard Petroleum refinery industry (semi-asphaltic flux)

Source: Compiled by Lin, Liang, Wang and Yang on the basis of an analysis of standards (China Environmental Standard, <http://www.es.org.cn>; MEP, 2009).

The technical committees for the standardisation of the petroleum and gas sectors are in charge of establishing *Shi You* (SY, “oil” in Chinese) standards. Experts belonging to the three state-owned oil companies (CNPC, Sinopec and CNOOC) sit on these committees. Among the industrial standards for the oil and gas sector, two standards apply to the environment: the HSE management system and the recommended practice for environmental protection (cf. Table 2). Standard SY/T 6276-1997 (the equivalent of ISO CD 14 690: 1996 ^[135]) serves as a reference framework for HSE management in the sector. The adoption of this standard indicates the commitment to align Chinese standards with those of large Western companies. Moreover, the NDRC’s energy bureau has issued several best practice standards to ensure environmental protection which are based on standards equivalent to those issued by the American Petroleum Institute (API).

[135] SY/T 6276-1997 “Petroleum and natural gas industries – Health, safety and environmental management systems”; ISO/CD 14690: 1996 “Petroleum and natural gas industries – Safety and environmental management system”.

Table 2 *Chinese petroleum industry standards for the environment (partial list)*

	No.	Title in English	Reference
General	SY/T 6276-1997	Petroleum and natural gas industries – Health, safety and environmental management systems	eqv. ISO/CD 14690:1996
	SY/T 6609-2004	Model environmental, health and safety (EHS) management system	API Publ. 9100A:1998, MOD
Sub-sectoral	SY/T 6048-2007	Health, safe and environmental management rules for gravity, magnetic and electrical (GME) crew	
	SY/T 6280-2006	Health, safety and environment management specification for seismic crew	
	SY/T 6283-1997	Health, safe and environmental management system guideline for oil and gas drilling	
	SY/T 6361-1998	Oil and gas production, water injection lease – Health, safety and environmental management systems guideline	
	SY/T 6362-1998	Health, safety and environmental management systems guideline for oil and gas workover	
	SY/T 6606-2004	Engineering and environmental basic requirements on petroleum industry	
NDRC recommendations	SY/T 6513-2001	Recommended practice for development of a safety and environmental management program for outer continental shelf operations and facilities	eqv. API RP 75:1998
	SY/T 6628-2005	Onshore oil and gas production practices for protection of the environment	mod. API RP 51:2001
	SY/T 6629-2005	Land drilling practices for protection of the environment	mod. API RP 52:1995
	SY/T 6672-2006	Natural gas processing plant practices for protection of the environment	API RP 50: 1995 MOD

Source: Compiled by Lin on the basis of an analysis of standards (China Petroleum Standard Information: <http://www.petrostd.com/>).

On the basis of this regulatory regime, companies set their own “corporate standards” to ensure uniformity of practices between all subsidiary and sub-contractor companies operating within the same group. In case of CNPC, these standards are termed “Q/CNPC”, and “Q/SY”.^[136] Each corporate standard is directly based on Chinese national or sector-specific standards. In this way, CNPC indirectly adopts international standards.

[136] “Qiye” means “company”.

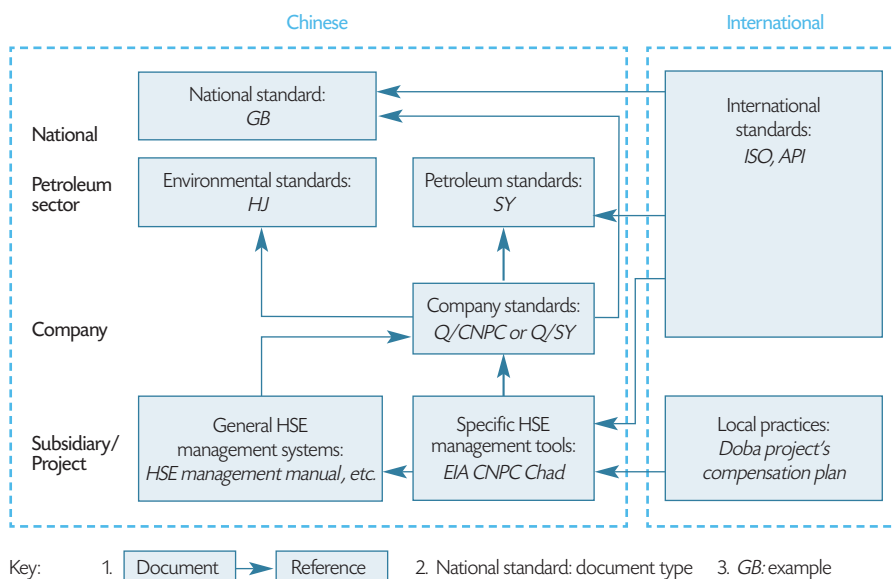
Table 3 *Some CNPC environmental norms and standards and national and international references*

CNPC Standards	National Reference	International References
Q/CNPC 104.1-2004 Health, safety and environment management systems – Requirements with guidance for use	GB/T 24001-1996 Environmental management systems: Requirements with guidance for use	ISO 14001: 1996 Environmental management systems - Specification with guidance for use
	GB/T 28001-2001 Occupational health and safety management system – Guidance	OHSA 18001: 1999 Occupational health and safety management systems. Specification
	SY/T 6276-1997 Petroleum and natural gas industries – Health, safety and environmental management systems	ISO/CD 14690: 1996 Petroleum and natural gas industries – Safety and environmental management system
Q/SY 10021-2007 Petroleum and natural gas industries – Health, safety and environmental management systems – Part 1: Specification	GB/T 24001-2004 Environmental management systems: Requirements with guidance for use	ISO 14000: 2004 Environmental management systems – Requirements with guidance for use
Q/SY 1002.2-2008 Petroleum and natural gas industries – Health, safety and environmental management systems – Part 2: Implement guidance	GB/T 28001-2001 Occupational health and safety management system - Guidance	OHSA 18001: 1999 Occupational health and safety management systems. Specification
Q/SY 1002.2-2008 Petroleum and natural gas industries – Health, safety and environmental management systems – Part 3: Auditing guidance	GB/T 19001- 2000 Quality management systems: Requirement	ISO 9001: 2000 Quality control systems: Requirements
	SY/T 6276-1997 Petroleum and natural gas industries – Health, safety and environmental management systems	ISO/CD 14690: 1996 Petroleum and natural gas industries – Safety and environmental management system

Source: Compilation by Lin on the basis of an analysis of standards and norms (China Standard Service Network: <http://www.cssn.net.cn/>; China Petroleum Standard Information: <http://www.petrostd.com/>).

CNPC developed the standard Q/CNPC 104.1-2004 “HSE management system – Part 1: Specifications” by referring to standard SY/T 6 609-2004, which partly adopts the American standard API 9 100A:1998, MOD (see Table 3).^[137] After being awarded ISO certification 14001-2004, CNPC revised Q/CNPC 104-2004 and replaced it with standards Q/SY 1 002,^[138] to which were added guidelines for implementation and auditing. These are based on Chinese GB standards, which are the equivalent of ISO standards (see Table 3). Figure 1 shows the relationship between CNPC’s environmental management tools, Chinese norms and standards and all of the reference standards used.

Figure 1 *CNPC’s composite reference standards and norms used in Chad*



Source: Compiled by Lin, on the basis of the analysis of standards (China Standard Service Network: <http://www.cssn.net.cn/>; China Petroleum Standard Information: <http://www.petrostd.com/>; CNPC, 2006; Du, 2005) and field interviews.

[137] SY/T 6 609-2004 “Model environmental, health and safety (EHS) management system”. Publ. 9 100A:1998, MOD. “Model Environment, Health and Safety (EHS) Management System A Voluntary Tool for Companies Interested in Developing an EHS Management System or Enhancing an Existing System”.

[138] Q/SY 1002.1-2007 “Petroleum and natural gas industries – Health, safety and environmental management systems – Part 1: Specification”; Q/SY 1002.2-2008 “Petroleum and natural gas industries – Health, safety and environmental management systems- Part 2: Implement guidance”; Q/SY 1002.2-2008 “Petroleum and natural gas industries – Health, safety and environmental management systems – Part 3: Auditing guidance”.

The left side of the figure shows Chinese standards at the national and sectoral level. From a technical standpoint (sampling methods, emission standards, EIA guidelines, etc.), CNPC adopts *a priori* Chinese standards. However, some of these standards are based more or less directly on international standards issued by umbrella oil-sector organisations or by the sector's national standardisation institutes, such as API. However, if local practices appear more suitable, CNPC is willing to retain them. Reference standards adopted in Chad by CNPC are therefore composite in nature. The implementation process also relies on other reference standards, mainly due to environmental obligations that were carried over with the purchase of the Encana permit.^[139]

4.3. The environment, an avowed priority for CNPC

We will first analyse the CNPC environmental management policy and principles, focusing on the commitments made by CNODC. We will then describe the organisational aspects and specific instruments envisaged.

4.3.1. HSE policy and tools: an intricate interlinkage

The information available on the CNPC (CNPC, 2003, 2006, 2007, 2009) and CNODC websites, as well as our exchanges with CNPC/CNODC managerial staff (in Beijing and in N'Djamena) indicate the group's clear commitment to an HSE policy with a long-term objective of *"zero accidents, zero injuries and zero pollution"* (CNODC, 2006). This commitment is reflected in CNODC's HSE Management System Manual.^[140]

The corporate HSE culture can be seen in the HSE management system, which includes the following principles: (i) give priority to people and put prevention first; (ii) control and prevent all accidents; (iii) ensure asset integrity; and (iv) ensure the protection of the environment (CNODC, 2006). The CNODC's HSE management system follows the "Plan, Do, Check and Action" (PDCA) management model. The CNODC mana-

[139] On repurchase of a petroleum permit, the buyer usually inherits the environmental obligations that the seller undertook at the time of obtaining its exploration and/or production permit. It is not certain however whether this obligation is part of the contract between the Chadian government, the Chinese government and CNPC.

[140] CNODC is part of the CNPC group and formulates its commitment as follows: *"CNODC takes very seriously its responsibilities to strictly comply with the laws and regulations of the host countries, ensure the safety of its employees, protect the environment and fulfil its social functions. We have thus made significant investments to set up the administrative systems and emergency response mechanisms required to ensure health, safety and environment protection. Our ethics and philosophy in the area of corporate social responsibility create benefits for all (our partners and us) and we strive to attain our long-term objectives of zero accidents, zero injuries and zero pollution"* (CNODC, 2006).

gement views the HSE system as one of the seven key pillars (CNODC, 2006).^[141] Since June 2007, CNODC has been ISO 14001 and OHSAS 18001 certified (CNODC, 2007).^[142] Closer examination of each of the seven key management components shows that CNODC's management system fully corresponds to the ISO 14001 standard for environmental management systems. This is hardly surprising as the CNODC operates overseas, often working in close partnership with Western companies, and is thus judged against global best practices (Du, 2005; Qi, 2007). Moreover, an HSE dimension is embedded into all management procedures and bodies as a result of the constant reference to the "Three Synchronisations" policy. As a reminder, this policy requires that development projects involving new construction work, renovation or reconstruction provide for environmental protection systems at all stages of design, construction and operation.

According to CNPC, the responsibility for HSE policy lies with all of the group's decision centres, supported by the HSE units or departments at each level. The *Management Manual for HSE Management System* was first published in 1999, at the time the SY/T 6276-1997 standard was adopted (Du, 2005). Over the past decade, this document has been frequently revised to reflect changing HSE standards. Depending on their activity or the specific project, the subsidiaries produce their own technical HSE documents based on the CNPC group documentation. As the subsidiary in charge of overseas investment operations, CNODC is responsible for HSE management in the subsidiary, CNPC International Chad.

Within CNODC, a hierarchy of rules governs the HSE documentation. For example, the contents of the HSE management manual override all other procedures, which in turn supersede the technical data sheets for all specific operations or tasks. At the same time, CNPC provides guidelines and HSE management practices which, depending on the context, may refer to OGP^[143] or API international standards (Du, 2005).^[144] The CNODC's internal HSE audit includes an annual audit of the HSE management system to be conducted at the head office, an HSE management audit of subsidiary companies and an internal evaluation conducted by the subsidiary companies (Qi, 2007). In addition

[141] The other key elements are: leadership and commitments; planning; organisation, resources and documentation; implementation and operation; inspection and correction; management review (CNODC, 2006).

[142] *ISO 14000: 2004, Environmental management systems – Requirements with guidance for use; OHSAS 18001: 1999, Occupational Health and Safety Management Systems Specification.*

[143] International Association of Oil and Gas Producers.

[144] CNODC's HSE standards documents comprise 13 procedure files (EIA management, environmental pollution control, etc.) and 28 operational guidelines including environmental monitoring management (Du, 2005).

to this arsenal of procedures and standards, EIA tools and practices are used. In spite of all this, the legal frame of reference chosen for Chad raises several questions.

4.3.2. A legal grey area that creates confusion

In fact, according to China's EIA Law, an EIA must be carried out prior to works in order to examine, anticipate and assess the potential environmental impacts of projects involving land management and construction. The EIA must also propose preventive or mitigation measures to counter adverse environmental impacts, as well as monitoring methods (NPC, 2002). If the contract stipulates, without further clarification, that Chinese law is the applicable reference, does this mean that Chinese legislation is to be enforced in Chad as it is in China? This should logically be the case; however, the same Chinese law explicitly states that it only applies to operations within Chinese territory or seas under Chinese jurisdiction (Article 3). There seems to be a legal contradiction in adopting as a reference standard (to be enforced in Chad) a Chinese EIA law that limits itself territorially to China.^[145] These are thorny questions for the constitutional and oil law experts. Moreover, the Chadian Law No. 014/PR/1998^[146] states that the EIA must be carried out prior to starting a project,^[147] while the implementing decree No. 630/PR/PM/MEERH/2010 on EIA regulation was issued only in August 2010. The CNODC is committed to comply with the laws and regulations of the countries in which it operates (CNODC, 2006). However, is it required to comply with an implementing decree that was signed after the contract was signed? We were unable to ascertain whether this 1998 Chadian law is explicitly mentioned as one of reference standards stipulated under the contract between the government of Chad, the government of the People's Republic of China and CNPC. The 2002 Chinese EIA Law also encourages the administrative authorities to seek the views of agencies, experts and the general public, except in cases where the government considers

[145] Article 3 of the Chinese EIA law (NPC, 2002) states that to work on any of the programmes as described in Article 9 of the present law or to build any project within the territory of the People's Republic of China (or within other seas subject to the jurisdiction of the People's Republic of China), EIAs must be conducted according to the present law.

[146] Law No.014/PR/1998 stating the general principles for protection of the environment; Article 80: *"when land development, works or projects, due to their magnitude or impact on their natural environment, pose a threat to the environment, the administration may require that the petitioner or the contractor undertake beforehand an EIA study in order to assess whether the project complies with environmental protection requirements"*.

[147] Law No. 014/PR/1998 stating the general principles for protection of the environment; Article 82: *"Impact studies governed by the present law and by its implementing legislation are carried out prior to any administrative declaration or authorisation required for operating the project. It is mandatory that these studies be submitted together with the request for authorisation or be presented at the time of declaration..."*.

that the information must remain confidential (Article 21). We do not know whether the Chinese government has decided that the information on the environmental impacts of the Rônier project are to remain confidential. Such ambiguities have affected CNPC's implementation of its HSE policy, especially concerning EIAs and the associated documents.

4.4. From theory to practice: implementing CNPC's HSE policy on the ground in Chad

How is it possible to study the way in which a corporate HSE management system is implemented when the company involved barely communicates?^[148] The CNPC's HSE management system is certainly highly developed, but it functions exclusively on an in-company basis, precluding any understanding of actual on-the-ground practices in the case of the Chadian project. Moreover the rare information available to the public is too aggregated (at group or subsidiary level, rather than at site or project level). As a result, obtaining first-hand information on the HSE management of CNPC's Rônier project was a laborious task. Nonetheless, informal field visits and face-to-face meetings did take place both in Chad and China. Given these circumstances,^[149] we will mainly address how the HSE system was set up and what processes were used to carry out the EIA for the Chadian project.

4.4.1. An HSE team open to using other reference standards

A specialised HSE team, reporting directly to CNPCIC's CEO, was set up as soon as CNPC began operations in Chad in 2007. The HSE department monitors environmental management and community relations and ensures internal follow-up for these two aspects. Two Chinese executives (including the HSE department manager) work at CNPCIC's head-office in N'Djamena. Both have experience and expertise in HSE management, gained in CNPC's China-based projects; one executive had

[148] Yet, we were aware of the difficulties concerning interactions between researchers and Western multinationals (see Coleval, 1977).

[149] Our research team did not have the necessary skills to verify whether the specific technical solutions adopted by the CNPC project (its components: oil field, pipeline, refinery) complied with Chinese standards, especially with regard to the objective of attaining cleaner production. CNPC affirms that the materials selected for its facilities comply with international standards (meeting with CNPCIC's President and CEO, June 2010). According to CNPCIC technicians, the horizontal directional drilling technology, used on the pipeline crossing over the Chari River, meets the highest international standards and enables better environmental protection (meeting with the CNPCIC's HSE department on September 2010); it allegedly has no impact on the living conditions of the local populations or on the river-based activities.(SHT, 2009a). These aspects, based on petroleum engineering, warrant future partnership research projects.

previously worked for a joint CNPC-Shell project in China and was endeavouring to share the lessons learnt.^[150] CNPC has also hired the entire Chadian environmental team (including managers in charge of community relations) that had worked for Encana, the company that sold them the permit for the Rônier project. Encana had trained its HSE team in line with the Canadian standards.

The recruitment of Chadian managerial staff, already trained by Encana, was a move that enabled CNPC to benefit from their environmental and social expertise, their field experience and their knowledge.^[151] Among the ex-Encana employees, a few people had previously been employed and trained by Exxon at the time of the Exxon-Doba project's construction phase. One such case was that of a Chadian community relations executive who reports directly to the senior management in N'Djamena. The CNPC's HSE team thus draws upon a wide range of experiences and knowledge and Chinese reference standards and practices dovetail with those inherited from the Shell project in China or the Encana and Exxon projects in Chad. This composite frame of reference is reflected in the EIA practices used.

4.4.2. Differences in EIA implementation for the two components of the Rônier project

In 2008, CNPC carried out an EIA on the Rônier project. We are unable to explain the reasons behind this decision, as the lack of clear regulations together with strong political pressures to implement the project swiftly could well have led to a different choice. CNPC's decision may partly be attributed to the company's adoption of the ISO 14001 standard, which recommends undertaking an EIA. It is also likely that CNPC simply acted as it would have done in China, which is to say, perform an EIA.^[152] However, other factors also need to be taken into account.

The EIA was carried out by the *CNPC East China Design Institute* (CEI) design office.^[153] The assessment was split into two parts: the first study on the refinery was to be carried out entirely by the CEI; the second study on the oilfields and pipeline was

[150] Shell has had a decisive influence on CNPC's environmental management (Qj, 2007).

[151] Encana has carried out EIAs, as well as archeological studies and socio-economic impact studies.

[152] According to the 2002 Law's rigorous requirements on environmental assessment.

[153] CEI is based in Qingdao, in China. Its subsidiary, China Petroleum CEI Safety & Environmental Protection Co. Ltd., is a CNPC research and technical support institution for HSE matters. It is involved in: safety technology, safety engineering, environmental sciences, EIAs, environmental engineering, etc. As often happens in conglomerates, all activities are carried out within the CNPC group. This is in sharp contrast with the extremely high level of outsourcing practiced by OGP companies, which finance the EIAs but subcontract their execution to specialised external consultancy firms.

partly contracted out to ISM Consult. This Chadian engineering consultancy firm was initially given the job of (i) describing the socio-economic aspects and the natural environments, (ii) conducting an appraisal of the environmental and social impacts, (iii) analysing major risks and (iv) proposing prevention and compensation measures (including the compensation and resettlement programme).^[154] Subsequently, after seeing the results, the CEI asked ISM Consult to prepare the compensation and resettlement programme for the refinery.

The decision to handle these two components separately may come down to differences in their levels of technological sophistication or in the structure of their financing and property ownership. The refinery was owned by SRN, which is a joint venture between CNPC and the Chadian government represented by SHT, whose equity participation is financed by a loan from the China Eximbank. The investment in the oilfields and pipeline, on the other hand, are directly financed and managed by CNPC. The fact remains however that both these studies had different outcomes.

The EIA for Chad's refinery project was commissioned in March 2008 and completed in early 2009. As pointed out by the CEI, it was completed despite a lack of detailed information on the initial conditions, especially with regard to meteorological and hydrological data, which are crucial for a flood-prone area. According to the SHT resource people we interviewed, the environmental impacts usually associated with refineries were identified and preventive measures were recommended and integrated. According to CNPC, the preventive measures taken were those required in China (Lin, 2010). A day of public consultation on the compensation and resettlement programme for the refinery zone was held at the *Centre d'étude et de formation pour le développement* (CEFOD – Centre for Development Studies and Training) in November 2009, with support from ISM Consult (Moctar, 2009). The EIA report for the refinery was approved by the competent ministries that same month. Yet, by October 2010, the full EIA report had still not been disclosed to the public. CNPC attributed this delay to difficulties in translating the document from English and Chinese into French.

The final draft of the EIA oilfield and pipeline report (ISM Consult, 2009a and 2009b) was completed at the beginning of 2010, when in fact the oilfield and pipeline construction works were already well advanced (Ngaemague, 2010). Notably, the

[154] ISM Consult mobilises experts who have worked directly or indirectly on the Doba project. ISM provides regular HSE support for CNPC's Chad project, which has thus taken on certain practices and regulations developed during the Doba project.

Chari River crossing had already been completed using horizontal drilling technology (SHT, 2009a). The EIA report (in French) for the oil field and pipeline was submitted to the Ministries of Petroleum and Environment in August 2010.^[155] However, in October 2010, these ministries had still not rendered their opinion on the study and the EIA report had not been made publicly available.^[156]

Both EIA reports were indeed completed by the respective engineering and design entities, but which frame of reference or directive guidelines had been used? Neither of the documents has been fully disclosed to the public, which is at odds with Chadian law but in compliance with the exception provided for by Article 21 of China's EIA Law. However, the fact that construction work on the oil field and along the pipeline route was started even before the EIA report had been approved runs counter to both Chinese and Chadian law. Only the EIA for the refinery had been completed and approved by the competent ministries prior to the start of construction work. Much in the same way that the World Bank had played crucial role in enforcing the Doba standards (as we pointed out in Part 2), could the greater degree of compliance in the case of the refinery be explained by the role of the China Eximbank?

In 2007, major economic cooperation agreements were signed between the governments of China and Chad (see Part 3). The Chadian government submitted a loan application to China Eximbank to finance SHT's equity investment in SRN,^[157] but the amount of the requested loan amount, its purpose and the environment-related conditionalities were not disclosed.^[158]

China Eximbank is the state export-import credit agency. It operates directly under the State Council and provides a wide spectrum of financial services.^[159] In 2007, it became the world's leading export-import bank.^[160] Over the last decade, it has

[155] Meeting with the Environment Ministry's director of research, planning and monitoring, N'Djamena, 26 August 2010.

[156] Nonetheless, the EIA seems to have partly fulfilled its role of providing guidance for the project even before the Chadian government had given its approval, as evidenced by the partial modification of the pipeline route, and the implementation of compensation in line with the report's recommendations.

[157] Meeting with Michel Boukar, SHT management advisor, 6 September 2010 at N'Djamena.

[158] A detailed questionnaire sent in May 2010 to the China Eximbank staff responsible for granting loans to Africa met with no response.

[159] Export credits for high added-value products; import credits for advanced technologies, equipment and resources; support loans to companies operating overseas; concessional loans to buyers of Chinese products, bridge loans for foreign organisations and governments.

[160] Interview with Li Ruogu, President of China Exim Bank, 6 May 2008, by Taimur Ahmad (Emerging Markets, <http://www.emergingmarkets.org/Article/1935225/Interview-with-Li-Ruogu-President-of-China-Exim-Bank.html>, accessed 11 April 2011).

granted African countries loans worth over USD 6.5 billion, most of which are for Chinese companies' investments in infrastructure projects (Bosshard, 2007).

In the field, the Chinese financial agencies are increasingly exposed to internal and external discussions on the environmental and social impacts of the projects they have funded (Suzuki, 2007). Since negotiating its entry into the Asian Development Bank in 2004, and then into the World Bank, the Chinese government has been increasingly confronted with the "Equator principles",^[161] which have been adopted by multilateral banks. These principles call on public and private financial institutions to comply with a series of standards and good practices, particularly in the area of environment. In 2007, without formally adhering to these principles (Suzuki, 2007), Eximbank set up similar environmental assessment procedures covering the entire loan cycle.^[162] Project financing has thus now become conditional on a duly completed and approved EIA. Eximbank's environmental procedures seem to require that environmental impacts be taken into account and monitored throughout the project lifecycle, along with environmental monitoring of project implementation and an ex-post environmental assessment.^[163] Thus, a prior EIA should, theoretically, have been one of the requirements for approval of the China Eximbank loan to finance SHT's equity investment in the refinery project. The conditionality imposed by Eximbank may explain why the EIA for the refinery was completed and approved by the government on time, before the work on the project started. However, the

[161] See site: <http://www.equator-principles.com/>

[162] An excerpt from Eximbank's environmental procedures states that *"China Eximbank considers projects' environmental impact assessment as one of the basic requirements and elements during the project review. We require the funded projects to conduct feasibility study of environmental impacts, and obtain endorsement or approval from the recipient country's environmental administration. Those projects that are harmful to environment or do not gain endorsement or approval from environmental administration will not be funded"* ("Exim Bank of China, Environmental Policy, translated English-language version: not for official use, section 6.1"), <http://pacificenvironment.org/downloads/Chexim%20environmental%20policy%20Chinese%20and%20English.pdf> (accessed on 11 April 2011). This text (see Pacific Environment, 2007) was sent on 29 April 2007 to Mr Doug Norlen, director of the NGO, Pacific Environment, following his meeting with Mr Li Ruogu (President of China Eximbank), Friday 13 April 2007, during the US Export-Import Bank's annual meeting in Washington (see <http://www.pacificenvironment.org/article.php?id=2362>, site visited on 11 April 2011).

[163] *"In 2007, we issued The Guidance for Environment and Social Evaluation on Loan Project and The Regulations on Loan Management and Operational Procedures for Energy Efficiency Financing Projects in Cooperation with the World Bank and other documents. By integrating the standards of energy saving and emission reduction into the credit granting system, the Bank has raised the threshold for loan application. Besides, we have set up the mechanism of withdrawing loans from projects with environmental risks, and have turned down projects that do not meet environmental standards. In addition, we built a project post-evaluation mechanism with a view to assessing the economic and social impact of the projects we have financed, so that we can constantly make improvement and give full play to our strength."* Interview with Li Ruogu, President of China Exim Bank, 6 May 2008, by Taimur Ahmad, Emerging Markets, <http://www.emergingmarkets.org/Article/1935225/Interview-with-Li-Ruogu-President-of-China-Exim-Bank.html>, accessed on 11 April 2011.

Eximbank loan processing procedure took longer than expected: by October 2010, it had still not been approved although construction work was well underway and had produced its initial impacts. Was this because Eximbank's environmental requirements were not entirely fulfilled? Or was it due to other financial or political reasons unknown to us?

4.5. The first observed impacts and how CNPC managed them

Drawing on the available data,^[164] we will attempt to analyse several types of impact^[165] observed during the construction phase and the responses provided by CNPC.

In 2009, a child accidentally drowned at Koud Alwa in an inadequately guarded laterite quarry used by CNPC for its construction work. The family of the deceased demanded CFAF 1.2 million in damages from CNPC (CPPN, 2009). The company immediately assumed responsibility for the accident, paid the amount demanded and stepped up safety measures around the quarries.

Noise and air pollution were also reported (GRAMPTC, 2004). People complained of coughing caused by dust emitted by CNPC truck convoys or trucks belonging to Chadian or Chinese subcontractors. Local residents also complained of traffic noise. We noticed that speed limit signs were erected along the CNPC-paved site access roads at village entry and exit points. According to CNPC and the people we interviewed, no trace of oil or chemical residue in the village wells was recorded in August 2010. However, when local residents drew attention to a problem of untreated wastewater at the company's waste sorting plant near Koud Alwa, CNPC took corrective measures to address this problem.

[164] Especially the EIA for the oilfield and pipeline components (ISM Consult, 2009a and 2009b). Although the text had not been drafted prior to the start of work, it provided abundant information on environmental monitoring during the construction phase.

[165] By "impact", we understand any sort of disturbance of the human or natural environment, positive or negative, significant or not, observable immediately or in the future (short, medium or long term), which is plausibly attributable, directly or indirectly, to a given activity. An impact can be managed through prevention and avoidance, mitigation, corrective measures and/or compensation. Numerous factors affect impacts (the specific characteristics of the host country, the context and the nature of the project, the technologies and equipment used, the schedule, the sequence and duration of activities, etc.). The rapid construction of infrastructure, as in the case of the pipeline (24 to 36 months) is an added constraint to preventing and managing impacts (Goodland, 2005). The manufacturing cost has a direct bearing on the performance, maintenance and replacement costs and the lifecycle of equipment (Lubomirsky *et al.*, 2010).

Photos 12, 13 and 14 *Strict HSE rules and responses to issues encountered*

12 / Prevent accidents by installing bilingual speed limit signboards in Chinese and in French (April 2009)



13 / CNPC quarry near Rônier oilfields: prevent drowning accidents caused by water collecting in quarry pits



14 / Hand pump financed by the CNPC as compensation given to communities (August 2010)



Photo credits: Géraud Magrin (photographs 12 and 13); Romain Dittgen (photograph 14).

Box 4 *Managing impacts*

The project work site produces common impacts that nonetheless need to be dealt with. Road traffic is one of them as it stirs up dust, frightens animals and is likely to cause accidents and damage existing tracks (Photo 15). The land area taken over will be limited, as the right-of-way areas will revert to their original use (agriculture, farming) once the pipeline is buried underground (Photo 16). The impact on land, however, will be greater at either end of the project: in the Rônier oil well zone and around the Djerma refinery.

Photo 15 *Heavy goods vehicle traffic*


Photo credit: Romain Dittgen, July 2010.

Photo 16 *Underground pipe near Chari*


Photo credit: Romain Dittgen, August 2010.

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Photo 17 *View of the Djermaya refinery under construction*


Photo credit: Romain Dittgen, September 2010.

Land occupation appears to be under control. The pipeline crosses through inhabited areas, hence farmlands, but few villages are directly affected.^[166] There is a wide variety of food and cash crops, such as pearl millet,^[167] sorghum, maize, peanuts, beans, sesame, sorrel, gumbo and watermelon. In terms of occupied land area, 960 ha were used for laying down the pipeline and constructing the connecting roads for transporting the equipment. After the pipeline is buried underground, only 100 ha will be permanently used to maintain and run the pipeline (ISM Consult, 2009a and 2009b). In August 2010, a road supplying the pipeline construction site had caused water retention, inconveniencing local residents. CNPC had to undertake the necessary repair work when the neighbourhood residents blocked the area.

So far, there have hardly been any impacts on biodiversity. This type of impact, initially expected in the Rônier project, was similar to the impacts that occur in other petroleum projects, especially the Doba project. The oilfields and pipeline are located in sparsely populated forest land, where there is diverse wildlife such as ostriches, monkeys and antelopes. The pipeline crosses the Chari River, where hippopotamuses are found. At this stage of the project (December 2010), the wildlife and flora in the region have not been significantly impacted.

[166] By destroying homes.

[167] Pearl millet, suitable for sandy terrain and highly variable rainfall, is the most grown crop, especially in Baguirmi.

During the observed construction phase, the economic spinoffs were few and far between: business opportunities for local entrepreneurs and job creation for the local population were rare. A limited number of Chadian businesses were contracted for transport and construction activities. According to the local authorities, the local trade distributors were bypassed by CNPC and Chinese subcontractors, who sent their own staff to the local markets, thus creating a direct fresh food market benefiting local farmers and herders.

The recruitment policy practiced by CNPC and its subcontractors is not encouraging for Chadian job-seekers (GRAMPTC, 2010). In the construction phase, only a limited number of jobs were open to nationals, even jobs for the least-skilled (labourers). On this point, Law No.006/PR/07 relating to hydrocarbons is often cited by the associations mediating between CNPC and local residents. This law stipulates that *“the contractor undertakes to recruit in priority Chadian personnel through public tendering procedures”*. It is uncertain whether this law is included as one of the reference standards under the contract between the Chadian government, the Chinese government and CNPC. In response to questions about its recruitment policy, CNPC points out that it has to keep to a very tight schedule imposed by the Chadian authorities.

According to the data collected, the working conditions of Chadian personnel differ widely, depending on whether they have been directly recruited by CNPC or by subcontractors (Chinese or Chadian). Chadian workers hired by a Chinese subcontractor work twelve hours a day for CFAF 2,000 (meals are at their own expense). Chadian workers hired directly by CNPC are paid higher salaries and lodged on the construction site. Few complaints have been registered against CNPC, but the company often suffers from being wrongly identified with its Chinese subcontractors (lower wages, no contracts, contested layoffs, etc.). Working conditions in contracted Chadian firms are also a source of tension (GRAMPTC, 2010).

Any large-scale project gives rise to expectations and it is up to the oil company involved to manage the resulting psychological impacts (Goodland, 2005). However, in the case of CNPC, this type of impact has been virtually absent: local residents seem to have interiorised and anticipated the fact that Chinese companies would prefer to hire Chinese manpower and rarely call on the local labour market. CNPC communications had made no mention of employment opportunities during the construction phase. However, it did send over one hundred young Chadians to China for training, with a view to their taking on positions of responsibility in the refinery. They were convened and selected in N'Djamena. These factors explain why there

have been no large-scale migratory flows in the Rônier region. This was contrary to what happened in the Doba region (Magrin, 2009), which saw a deterioration in living conditions in towns such as Bébédjia (prostitution, HIV) that created, “a space under pressure” (Médard and Ozias, 2007). This near-absence of migration could also be attributed to factors such as the collective memory of job-seekers disappointed with the Doba experience or the oilfields’ distance and remoteness.

As foreseen in CNPC’s HSE approach, the company has set up a compensation system for the material losses incurred during the construction and operation of its facilities. The main difficulty, already experienced by other oil projects in sub-Saharan Africa, is to adapt individual or community compensation programmes to a complex land tenure system in which the State is the sole landowner, but where local populations enjoy land use rights under customary laws. A given area of land or resource therefore entails various duties and rights for multiple stakeholders. In this context, individual compensation generally gives rise to more problems than it solves.

Villagers are paid individual compensation based on the lands affected or the number and type of trees destroyed due to the construction of the oil facilities. The prices of trees and land are assessed and defined in the compensation programme. If the pipeline crosses a field, the CNPC team measures the surface area taken up and counts the number of trees in the field for compensation purposes. The “owner” (*i.e.* the person working the field) then confirms the information recorded by CNPC. Once the data have been collected, a meeting is held at the canton’s administrative capital, where payment is made in the presence of the canton chief using a detailed compensation form.^[168] CNPC has adopted the compensation rates previously applied by Encana (CFAF 73/m² in August 2010).^[169] According to the chief of the Koud Alwa canton, the company limits compensation to cultivated land, which *de facto* excludes lands that have been lying fallow for more than two years. However, in the regions with low agricultural yields and low population densities, production systems depend on extensive farming techniques in which the practice of keeping lands fallow is common. The fallow periods vary widely depending on the potential for cultivation and on demographic pressures. For instance, in Bouram, a large village in the Baguirmi forest, land is left fallow for three years, whereas in Sabangari, a small village further north in Fellata Haoussa, land is kept fallow for between ten and fifteen years. Paradoxically, although CNPC considers fallow land as having no value, the Chadian government,

[168] Meeting with Ismaël Moutar, ISM Consult, 26 August 2010, in N’Djamena; meeting with Nassingar Rimtebaye, CPPN coordinator on 25 August 2010, in N’Djamena.

[169] According to the information gathered during exchanges with the residents of the different villages and the Loug Chari local authorities.

in order to curtail deforestation, has made it illegal to fell trees, even on fallow land, for the purpose of charcoal production. Any offenders are threatened with dissuasive fines. Associations demand that one hectare of fallow land occupied by the project should at least match the state fine levied on the villagers who claim the right to use the shrub vegetation growing on their fallow land. Furthermore, although the compensation system seems to be the most suitable approach (based on experiences with other similarly complex land situations), it has now come to a standstill.

CNPC is seemingly planning to offer community compensation, which will require larger budgets but only during the operations phase. This decision has apparently met with the approval of the Chadian government, as it will ease the pressure on CNPC and SRN liquidities for as long as no revenues are forthcoming. So far, only three drinking water wells and five hundred school-bags have been offered to compensate the inhabitants of Koud Alwa, a large village (nearly 2,000 inhabitants) close to the oil wells. This approach, though financially sound, has triggered protests from the local inhabitants, who are generally well aware of Exxon's more generous practices in the Doba zone. In the meantime, the demands of local residents have been transmitted to the Chadian government and the Chinese company. If these demands are ignored, they may jeopardise the company's "social license to operate".^[170]

4.6. Future environmental challenges

4.6.1. *Developments requiring the assessment of cumulative impacts*

An initial analysis of CNPC's HSE management in Chad is globally positive: observable impacts seem to be either absent or minimal and appropriately dealt with by the company. However, would this view still hold true if "cumulative impacts" were taken into account, especially those associated with the future activities already envisaged?^[171]

As at December 2010, CNPC had not explicitly addressed these cumulative impacts. The environmental study for the Rônier project had been divided into two separate

[170] This expression refers to the legitimacy and acceptability needed for a company to carry on its business (see Donner, 2011).

[171] We understand "cumulative impact" to mean incremental effects over a certain period of time, which are plausibly attributable to a single activity or a group of activities. CNPC's environmental experts are familiar with the idea of cumulative impact. In a recent paper, researchers at the CNPC Research Institute of Safety and Environment Technology write: "According to the recognition results of the layout's environmental impact, we should forecast and analyze possible environment and resource impacts resulted from its implication (including indirect, cumulative and accident risk), and analyze the total pollutants emission and control level of resources consumption after layout, so as to find out measures to alleviate adverse environmental impacts" (Xingchun et al., 2010:11).

EIAs (one for the refinery and the other for the oilfield and pipeline), but it offered no perspective on the potential cumulative impacts of these two parts of the project. Moreover, the EIAs did not integrate the possible cumulative impacts of the activities already planned. It is true that these substantial investments had been announced little by little and only a trickle of information had been released. The investments will finance the connection of the refinery's power plant to N'Djamena's electricity grid, the construction of an industrial zone adjacent to the Djeremaya refinery (a project for an airport was added in April 2011), the drilling of new wells and the probable link-up between the CNPC oilfield and the Exxon pipeline connecting Komé to the Kribi offshore terminal.

CNPC agreed to the Chadian government's request, relayed by the Chinese Embassy, that the Rônier project include the construction of a refinery and an electric power plant. The refinery will operate on fuel oil and consume only 20 of the 40 MW produced. The remaining 20 MW will be used to increase electricity supply on the SNE's N'Djamena grid (via a high voltage power line, under construction at the end of 2010, but no EIA has yet been carried out on this component). It will also feed the industrial zone due to be built adjacent to the refinery.

Apart from the positive economic effects expected from the industrial zone (see Part 3), its social impacts (volume and type of jobs) and environmental impacts (land-take, emissions, noise, effluents, waste) have not been studied. As yet, little is known about the activities to be developed. The construction of industrial facilities around Djeremaya will thus demand considerable efforts from the Chadian authorities in charge of regional and land-use planning and environmental management. In addition, the possible connection of the CNPC oilfields with the Exxon pipeline will pose serious challenges.

In fact, the refinery lacks the capacity to absorb all of the production envisaged. Moreover, production levels will likely rise as new oil wells come on stream and an export system is built to ensure the profitability of the satellite oil deposits around the Rônier field. In a geographically landlocked setting, the question also arises of how to ship the raw crude that is not processed on-site. Among the different scenarios (see Part 3),^[172] the most likely option would be to connect the Rônier oilfields with the Chad-Cameroon pipeline operated by the Exxon-led consortium.

[172] As a reminder, one of the options would be to the north-west, via Niger, by connecting to the pipelines of the West African countries where the CNPC is already operating. A second option would be eastwards, by constructing over 1,300 km of pipeline to join the already operational pipelines in Sudan (but unexpected competition has emerged between CNPC and Sinopec; cf. "The Sudan incident" analysed by Liou, 2009). The third option, via the south, is to construct a pipeline nearly 150 km long linking up to the Komé (Chad)-Kribi (Cameroon) export pipeline managed by the Exxon-led consortium (SHT, 2009b). This seems to be the most technically and financially viable option (despite a great number of difficulties and challenges).

Many factors seem to indicate that, in effect, this last option is under consideration (if not already finalised ^[173]). According to the former Petroleum Minister, Mr Mahamat Nasser Hassane, *“The CNPCI-SHT consortium has already contacted Esso consortium with a view to starting discussions on the pipeline connecting to the Komé-Kribi export pipeline”* (SHT, 2009b). According to a Stratfor Global Intelligence report dated 14 January 2011, CNPC executives have held three meetings with the COTCO directors responsible for supervising the Cameroon side of the Chad-Cameroon pipeline project. It is likely that a negotiated solution will be forthcoming and an agreement ^[174] will herald in peaceful Sino-American cooperation. However, the decision to ship the Rônier production *via* the south-west through the Komé-Kribi export pipeline will have two major implications for the parties involved: firstly, technologies will need to be made compatible and technical solutions found in order to alternately ship different types and compositions of crude (difficulties that are easily surmountable, according to the engineers of both firms, interviewed from June to December 2010). And secondly – this being a far more complex challenge – the HSE approaches of both companies must be aligned with each other.

An important point, of interest to all parties, is whether Section 4.10 of the Loan Agreement of 29 March 2001 between the World Bank and Chad within the Doba project framework remains valid, for which parties and for how long (Maoundonodji, 2010). According to this section, *“The Borrower shall ensure that any oil developed outside the Doba Basin Oil Fields which is proposed to be transported through any part of the Transportation System in Chad is developed in accordance with the principles set forth in the EMP with respect to environmental analysis and protection, consultation, information disclosure, resettlement and compensation and with the equivalent legal and administrative approval processes and information disclosure as applied with respect to the oil developed in the Doba Basin Oil Fields”* (quoted in Maoundonodji, 2010).

Yet, even if this clause no longer applies, the parties will remain subject to rigorous internal and external requirements and will be confronted with the need to agree on reference standards and environmental practices. The prospect of connecting pipelines has more serious environmental and geostrategic consequences than those foreseen in the preliminary EIA draft, which we were able to study. This indicates the need for a better understanding of the similarities and differences between the HSE approaches and practices of both projects.

[173] It is possible that this option had already been envisaged by the parties at the time CNPC negotiated its entry into Chad. However, the Rônier production estimates were only upgraded after the drilling operations in 2009.

[174] At this stage, cooperation between CNPC and Exxon appears likely, but other options cannot be dismissed. The risk for CNPC is that this would reduce the rich institutional legacy of the Doba project to nothing more than a pipeline (see van Vliet *et al*, 2011).

4.6.2. Comparison between the HSE approaches used in the CNPC and Exxon projects

The Exxon-Doba and CNPC-Rônier projects have much in common in the area of HSE. In fact, although the technical standards used by the two companies remain the industry standards of their home country, the HSE management norms and standards tend to converge. As mentioned at the beginning of this chapter, Chinese oil companies (such as the CNPC group) have mostly adopted or adapted the HSE standards of Western companies. Export-Import banks (Eximbank) of both countries (China and the United States) are involved in the projects and have ensured compliance with standards, notably environmental standards, (Suzuki, 2007;^[175] Pacific Environment, 2007). Both companies manage different but clearly drawn up and well-developed HSE systems. Both projects have experienced relatively similar non-compliances during the construction phase (relating to dust, noise, quarries, waste material, road accidents, compensation, etc.) and both firms have addressed these issues swiftly. Both companies have faced the same problem of choosing an appropriate approach to compensation in situations of complex land tenure rights and heavy demands from the local communities near to their project sites.

However, deep differences do exist. These stem from the context in which the two projects were set up, the history of each company and their conceptions of the importance of communicating with external stakeholders.

The Exxon-Doba project has been deeply marked by the conditionalities imposed by the World Bank, a multilateral aid agency which itself has come under criticism from Chadian and international civil society. As a result, Exxon does not view HSE as simply an internal technical process for reducing the number of incidents. The company has also made information on non-compliances publicly available, especially the cases brought to light by the project's external monitoring mechanism (ECMG, 2003, 2005; IAG, 2009; cf. Part 2). The main environmental management documents have been disclosed; the company, the Chadian government and the independent external agencies all monitor the implementation of the HSE systems. Exxon is also used to handling difficult environmental negotiations with American federal agencies, as well as with local authorities and NGOs. Some employees have been trained to communicate and engage in dialogue with stakeholders. Moreover, HSE communication and dialogue are an integral part of the management tools that bolster the

[175] "The Export-Import Bank of the United States itself has applied strict environmental guidelines to the US exporters since 1995" (Suzuki, 2007:130).

company's "*licence to operate*", and periods for dialogue and consultation with external stakeholders are explicitly included in the HSE procedures. At Exxon, although access to production sites is strictly controlled and limited, external interested parties (government officials, NGOs media, researchers, etc.) can meet with the company's management via the Communication and Public Relations Department, community development managers or the HSE department. While any company understandably needs to prohibit public access to certain areas, CNPC has set up extremely restricted procedures and opportunities for communication with external stakeholders.

4.6.3. *The challenges of communication and dialogue*

Communication and dialogue represent a real challenge for CNPC in Chad, not only with respect to its internal relations (between Chinese and Chadian employees), but also to its ties with external actors (ministry officials or territorial administration officials, Exxon HSE staff, associations, NGOs, experts and researchers). Occasionally, the company has channelled its messages through *SHT Magazine*. A few inaugural ceremonies have provided the opportunity to discover a scale model of the refinery and the plan for horizontal drilling under the River Chari.^[176] Apart from the days of consultation organised by ISM Consult to discuss the refinery and the compensation programme for pipeline works, we noted that the company structure does not enable it to communicate (in both directions), share information and engage in dialogue with its various stakeholders, despite the fact that Chinese laws provide for dialogue and consultation (SEPA, 2006).

[176] An inaugural ceremony for the horizontal drilling operations under the Chari was held on 16 December 2009. Attendees included Chadian government officials, Chinese embassy officials in Chad, and Chadian civil society representatives. A presentation of the drilling process and its technical aspects was handed out to the guests (meeting with Djube Nadjilengar, CROSCAP LC coordinator, 13 August 2010, Bousso.)

Photos

18 and 19

Opening for dialogue still too rare

18 / Public meeting at Daradja Bousso for the preparation of the EIA



Photo credit: Géraud Magrin (April 2009).

19 / Meeting between CNPC Chad HSE department and the research team



Photo credit: Romain Dittgen (September 2010).

CNPC has put various mechanisms in place to reduce the language barrier separating the company's Chadian employees from their Chinese colleagues. The company explained that French or English could be used to communicate, with the help of an interpreter. The problem is less serious for executives as they communicate in English. On site, Chadian workers, who are often low-skilled and speak very little French, are given instructions through an interpreter or a Chadian worker able to translate. This

gives rise to frequent misunderstandings. Language training programmes for both sides will certainly partly solve the problem, although the problem is not only a linguistic one (Feng and Mu, 2010).

The terms of the contract between the Chadian government, the Chinese government and CNPC have not been disclosed; even the environmental clauses have not been published. According to the preliminary EIA draft that was circulated, Chinese norms and standards were set as the frame of reference, but these were not communicated or explained to the stakeholders in Chad (environment officials, local residents, NGOs and Exxon HSE staff). On several occasions, our contacts expressed doubts as to whether Chinese environmental standards actually existed.^[177] Although the EIA report for the refinery was presented at a public meeting, it is still unavailable even though approved. The Environmental Management Plans (EMP) and Accidental Spill Prevention Plans (ASPP) have not been disclosed to the public and are unavailable at the Ministry of Environment. Local residents and local authorities were unaware of their role in the project, even in case of accidental spills. Even more serious is the fact that Exxon's HSE officials still had no access to these plans in October 2010, whereas the usual practice for oil companies operating in the same country is to agree on a course of action in case of a Level 2 incident, which requires a concerted response involving all of the industry's resources available countrywide. The Exxon and CNPC HSE managers are not used to meeting together, which is an additional factor that feeds rumour and stereotyping. Under these circumstances, the project's environmental regulation cannot be externally monitored by State representatives, local authorities, NGOs, local residents or researchers.

For CNPC, the sole interlocutor is the Ministry of Petroleum. Chinese executives working on the project rarely meet with local authorities (prefectural and sub-prefectural officials or sultans).^[178] In this case, field visits are carried out by the Chadian HSE staff, who are experienced and well acquainted with the local customary modes of communication and have thus managed to gain the villagers' trust. Nonetheless, during our interviews, many locals living near the oil facilities complained that their discussions were always with Chadians, never the Chinese. This criticism reveals that in the eyes of the local population, Chadian employees are not the true representatives of CNPC^[179] or, at least, they are not the decision-makers and do no

[177] Various meetings in Chad from June to December 2010.

[178] Meeting with a prefect, 13 August 2010.

[179] The local residents living near the facilities wish to meet "the Chinese" and establish regular contacts and meetings with them. This wish was expressed during village "focus groups" and in meetings with local NGOs, 13-15 August 2010, Rônier oil zone.

more than transmit information.^[180] This situation engenders mistrust and misunderstandings between the company, the local authorities and local residents, which impair the corporate image.

What can explain this low propensity to engage in dialogue? In Western countries, environmental management is a process involving multiple stakeholders with diverse interests, and companies have learnt to communicate and cooperate with them; Shi and Zhang consider that this is not yet the case in China, where the State traditionally has a monopoly of environmental governance (Shi and Zhang, 2006). Rowe and his team agree with this analysis, pointing out that corporate environmental management in China is mainly influenced by state institutions (Rowe and Guthrie, 2009). However, since Hu Jintao's presidency, civil society participation in environmental matters has increased perceptibly (Shi and Zhang, 2006) and new EIA standards on participation have introduced new practices (see Part 1). CNPC's approach to dialogue will be unable to develop as long as its HSE procedures remain unchanged.

In a company as highly organised as CNPC, this lack of dialogue with outside stakeholders certainly stems from the fact that the company has no procedures to deal with this aspect. The HSE procedures are basically technical, intended for in-company use in view of achieving the corporate goal to reduce incidents – this is important and necessary, but not enough. Company organisation charts show a proliferation of closed-loop procedures between HSE high committee appraisals and review and management appraisals, HSE monitoring, inspection and evaluation, actions and monitoring, etc. (CNPC, 2007). But no diagram or chart shows any space for communication or dialogue with outside stakeholders, or indicates how such spaces could enhance the quality of the HSE processes.

CNPC's charts and HSE manuals could take greater account of stakeholders operating outside the company, in which case its procedures and technical documents would need to be reviewed accordingly.

4.7. Conclusion

In this chapter, we have attempted to answer the following questions: what environmental norms and standards regulate CNPC's operations in Chad within the Rônier project? Are these clearly stated and complied with in practice? How are the impacts, notably cumulative ones, anticipated and dealt with? What are CNPC's major challenges

[180] They express dissatisfaction that they are only dealing with the "shell" of the organisation as opposed to its "core" (made up of Chinese staff) where all the important decisions are made (van Vliet and Magrin, 2007).

regarding its interactions with the host environment in Chad and its future interactions with the Exxon-Doba project? Despite the difficulty of accessing information, we are able to provide the following answers.

In China, there is a growing interest in environmental issues, which is reflected in the development of environmental regulation. This has had a direct impact on companies, where environmental management has genuinely taken root.

CNPC, a major Chinese oil company operating on an international scale, has upgraded its system of environmental management. It intervenes, however, in very diverse settings and has thus to deal with different expectations. The fact that it has adopted as a reference standard to be applied in Chad a Chinese EIA law that limits itself to Chinese territory gives rise to a legal problem.

The EIA was split into two parts in order to integrate the particularities of each project component, particularly the financing structure. China Eximbank seems to have played a decisive role in ensuring that the EIA for the refinery was completed swiftly. The EIA report for the oil field and pipeline was submitted to the Chadian authorities in August 2009 and the opinion of the Chadian authorities was still pending in December 2010, but this did not prevent the construction work from starting. Although consultation processes were set up, notably for the compensation programmes, the full EIA documents have not been made public. Yet, the EIA seems to have fulfilled its role as far as the internal steering of the project is concerned (rerouting the pipeline, additional preventive measures for safety around the refinery, etc.). Thus far, the environmental management plans and accidental spill prevention plans have not been made public.

The impacts noted in December 2010 are on the whole either non-existent or moderate, and adequately managed by CNPC. Although the impacts mentioned by each EAI seem relatively weak, it should be noted that the cumulative impacts have been given little consideration. These impacts may come to light when the combined effects of the components covered by the EIAs are studied. Likewise, they may be linked to the combined effects of other activities, which have been announced but for which information disclosure has not been regular.

The likely connection between the CNPC-Rônier oilfield and the Chad-Cameroon pipeline thus poses major problems. If it is to go ahead, the effective legal scope of the commitments made by the Chadian government and the World Bank needs to be more closely scrutinised, and a careful analysis of all of the clauses of the contract signed in 2001 will require expertise in constitutional and petroleum law. This possible pipeline connection will also raise the problem of compatibility between the CNPC and Exxon HSE approaches.

The comparative study of the two projects sheds light on the contexts and standards of both companies, their relative responsiveness to signals from outside and the implementation of their HSE management systems. Yet, a comparison of the role given to the HSE function reveals significant differences.

Thanks to fact that the Doba project (under the much disparaged aegis of the World Bank) served as an experimental laboratory, Exxon's HSE department is not only an internal technical tool for preventing or reducing incidents: it has also become a key interface for external stakeholders. This transparency reinforces the impression that the firm takes its HSE functions seriously and has fully internalised them. This impression is confirmed by the size of the HSE department and its position within the corporate hierarchy, as it has the authority and the duty "to sound the alarm". Exxon's target audience stretches beyond its employees and subcontractors to include its external stakeholders, who closely monitor the firm's compliance with the environmental rules of the game.

CNPC has a well-developed HSE system deeply embedded within its management structure, which thus encourages the internalisation of HSE concepts and procedures. However, this entrenchment may come at a cost to the HSE department's relative autonomy, as greater independence is necessary if it is to fulfil its "whistle-blowing" function for projects under strong political and economic pressure. For want of available information, we were unable to conduct an in-depth study of the internal functioning and effectiveness of the HSE system. On the other hand, we were able to observe the setting-up and implementation of EIA procedures.

The HSE system in CNPC is technically oriented and inward-looking. Its main focus is the prevention of incidents and accidents, and its main target the employees working in the company and its Chinese subcontractors. The HSE procedures do not explicitly define any spaces or roles to engage in dialogue with stakeholders outside of the company. This shortcoming may mean that CNPC will be unable to participate in formulating new HSE standards, even though it proposes ways forward in terms of content. However, the recent adoption by CNODC of two new HSE principles would seem to herald a new approach.^[181]

[181] The page "Society and environment" on the CNODC website has been updated to include the following principle: *"Maintain public confidence in the integrity of our operations by openly reporting our performance and consult with people outside the company to improve our understanding of external and internal HSE issues associated with our operations"*. Another principle emphasises the need for communication: *"Communicating with the public and making CNODC's HSE performance popular,"*
<http://www.cnpcint.com/societyandenvironment/hse/hsestrategies.html> site CNODC, accessed on 12 April 2011.

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Part 5

5. The CNPC in Central Africa: a comparison of experiences in environmental management in Sudan, Niger and Chad

Romain DITTGEN

5.1. Introduction

The rise in China's energy requirements has led to a mushrooming of oil projects in Africa. As a net importer of oil since 1993, this emerging power has seen its external demand grow at an exponential rate, up from 25 million tonnes in 1995 to over 300 million today (Sanjuan and Trollet, 2010: 123–124). Its late arrival on the international stage, combined with the desire to avoid being overly dependent, has pushed the Chinese government to adopt a strategy of diversifying its oil supply sources. At the same time, the appearance of Chinese transnational enterprises has begun to transform the global economic and political landscape (Alden and Davies, 2006:83). The growth of these firms has been favoured by bilateral relations that frame active cooperation. China has thus very rapidly become a petroleum giant.^[182]

For Chinese firms, Africa is seen as a laboratory or a testing ground, which at the same time offers them some favourable opportunities for integration (Bosshard, 2008). In the extractive sector, a few Chinese firms such as CNPC have thus been able to develop huge projects with the backing of the State. The African continent is home to one third of the overseas missions undertaken by CNPC (9 out of 27 countries). Although Angola today is currently the leading African oil supplier for China, it was the context in Sudan at the end of the 1990s that initially helped Chinese oil firms to

[182] This success was symbolised by the market capitalisation of the Petrochina group, a CNPC subsidiary.

move into the continent. CNPC has been in Sudan for the last fifteen years and still holds a very strong position there today. With the development of new projects, in Chad and Niger for example, this Chinese transnational has very clearly indicated its intention to play a prominent role on the international scene (Paone, 2007:236).^[183] This growing presence in Africa raises the question of how the company is organised with respect to environmental management. In the Sahel region, three projects of different sizes and at different stages of advancement provide an opportunity to study the management and evolution of CNPC's environmental regulation.

In this chapter, we will attempt to answer the following question: in the environmental field, have the lessons learnt in Sudan been applied to other more recent CNPC projects operating in the same geographical area? Can one speak of a regional environmental management approach adapted to the Sahel region? Or is its environmental policy defined on a case-by-case basis in line with the rules set by the head office in Beijing?

In this chapter we will test the following hypotheses:

- Interaction and exchange between the various operational sites in Africa has led to the creation of a common frame of reference that influences the implementation of new projects.
- Despite some similarities across the three countries, CNPC operates on a case-by-case basis for environmental management.
- CNPC's long experience in Sudan has enabled it to gradually improve its environmental regulations as well as its community relations.
- Under growing international pressure, CNPC has transferred the capacity for dialogue that it developed in Sudan to Chad and Niger.

By comparing a project already in the production phase (Sudan, since 1995) and two projects in the construction phase (Chad and Niger, 2009–2011), we will examine the different timeframes in the context of a broader oil cycle. The difference in the maturity of these three projects will allow us to test the validity of the hypotheses concerning the mining cycle (van Vliet, 1998). More specifically, we will examine how CNPC adapts to realities on the ground.

[183] In 2003, the former chairman of CNPC had insisted on the goal of becoming a globally competitive, multi-national firm.

The literature on China's extractive activities in Africa is increasingly abundant and diversified (Alden and Alves, 2009; Ennes Ferreira, 2008; Downs, 2007; Large, 2008; Li, 2010; Soares de Oliveira, 2008; Taylor, 2006). However, very few studies specifically address the environmental stakes of China's presence on the continent (cf. Bosshard, 2008). Similarly, cross-country research on environmental issues for the purpose of regional comparison is still embryonic.

For Chad, data was collected during a three-month research trip (June to September 2010). For Sudan and Niger, our data was drawn mainly from various NGO reports as well as scientific papers and the press. The comparative analysis enables us to examine a phenomenon that can be observed in different contexts and use different study scales to compare two or more objects and identify their points of similarity and difference, and then attempt to explain these (Bloch, 1928; Detienne, 2000). The aim here is to compare oil operations deployed by CNPC in Sudan, Chad and Niger in order to understand the rationales underlying the company's choice of location and the way in which it has integrated the environmental dimension into the management of the different sites.

All three countries show similarities in the ecological and socioeconomic domains. On the basis of these observations, one could assume that CNPC has implemented similar environmental practices (5.2). However, the specific political contexts in each locality have impacted these practices differently. The players' organisational capacities and margin of manoeuvre are greatly influenced by the national setting (5.3). Finally, although a few key moments have helped to drive environmental regulation in the three countries, efforts to improve practices have often proved difficult and come up against a series of different obstacles (5.4).

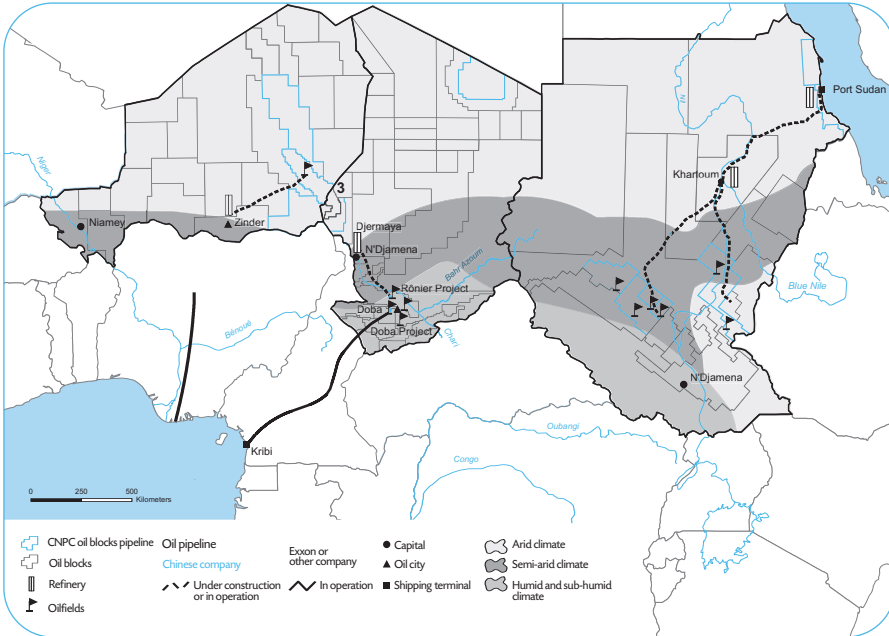
5.2. Similar challenges and contexts for environmental management

CNPC's operations in all three countries allow us to draw several parallels in terms of the host environments, the role of the extractive sector in the national economies and the recent consolidation of environmental regulation.

5.2.1. *The oil projects and their environments*

The oil exploitation areas in Sudan, Chad and Niger are located in similar ecological zones; they are also facing to a certain extent the same socio-political challenges.

Map 6 Chinese projects in their environment in Central Africa (2010)



Source: design by R. Dittgen; produced by J. F. Cuenot based on data from CNPC (Sudan and Niger) and the Ministry of Petroleum (Chad).

CNPC has been present in Sudan since 1996 and operates several oilfields. Since the end of the 1990s, it has headed the Greater Nile Petroleum Operating Company (GNPOC) consortium^[184] and, as the operator, is exploiting blocks 1, 2 and 4. These Heglig fields, connected to Port Sudan by a 1,650 km oil pipeline since 1999, account for more than half of the Sudanese production. To open up oil production in this zone, a refinery was constructed near Khartoum and an oil terminal at Port Sudan. In 2000, CNPC won a tender for blocks 3 and 7 and operates these as Petrodar's majority shareholder.^[185] The discovery of large-scale deposits^[186] in these blocks

[184] This consortium comprises the Chinese firm, CNPC (40%), the Malaysian firm, Petronas (30%), the Indian firm, ONGC (25%) and the Sudanese firm, Sudapet (5%).

[185] The Petrodar consortium comprises CNPC (41%), Petronas (40%), Sudapet (8%) another Chinese firm, Sinopec, (6%) and the Al Thani Corporation, UAE (5%).

[186] According to CNPC data.

justified the construction of a second 1,385 km pipeline routed in the direction of Port Sudan to connect up with the first pipeline close to Khartoum. CNPC is the sole shareholder of block 6 located west of the Heglig fields. Initially, production levels in this block were relatively low (10,600 barrels/day). However, in 2006, following a series of drillings in the Fula field, output increased and has since reached over 40,000 barrels/day. More recently, CNPC began drilling in two other blocks (13 and 15) in the north-east of the country close to Port Sudan (Total, 2009), which involves offshore oil operations. This overview of CNPC projects underlines the intensity of Chinese oil activities in Sudan. It also shows the diversity of ecological environments affected by the impacts of these operations (cf. Map 6).

The geographical and geopolitical location of the oil projects has a strong impact on the degree of environmental sensitivity (cf. Map 6).

- In Chad, the pipeline crosses moderately populated areas but these are close to the country's demographic and economic hub; however, the geopolitical context here is less sensitive than in the south, in the Doba project zone (cf. Parts 2 and 3).
- In Niger, oil activities are being developed in a remote fringe area. In addition to the expected oil rent, one of the stakes in developing economic activities in this area may be a more effective integration (and control) of the eastern part of the country

Depending on the distances covered by the various pipelines, the range of ecological zones is more or less limited, and biodiversity has different degrees of variety and vulnerability.

In Sudan, moving from the oilfields to the oil port, the climate gradually changes from the edge of a humid tropical zone (800–1,000 mm annual rainfall), into the Sahelo-Sudanian zone (600–800 mm) and finally into the arid zone (100 mm). The vegetation adapts to the respective climates: wooded savannah in the south, followed by savannah shrubland and desert flora in the north (Ben Yahmed *et al.*, 2009:209). In the south, the natural habitat is fragile and would need environmental management if extractive operations are developed. It harbours one of the world's largest freshwater reserves with floodplains covering up to 100,000 km². The region includes several oil concessions: block 4 and a large part of blocks 5a, 5b and 5. These blocks are entirely located in the western, eastern and northern Upper Nile states, as well as in Abyei. The south is home to a particularly rich flora and fauna mainly comprising zebras, crocodiles, giraffes, elephants and various species of migratory birds, which depend on the

region's vast water resources (Tutdel, 2010:12-13). If the aquifer and surface water were contaminated, the impact on the local populations and wildlife would be considerable. The Chinese pipelines cross the vital River Nile axis, which poses specific environmental challenges. The pipeline of the Petrodar-led project crosses the marshlands of "Marchar" and follows the banks of the White Nile. Crossing these marshy areas heightens risks in the case of an oil spill, particularly with respect to the local communities and animals that use the river water, and this would have dramatic impacts both for Sudan and Egypt.

In Chad and Niger, a Chinese presence in the oil sector is recent (2007) and production will not go on stream until late 2011 or in 2012. CNPC has invested simultaneously in oil projects that share similarities in terms of size, contractual arrangements and the challenges to be addressed.

In Chad, the oilfields are located in the centre-south region, more specifically in the Bongor Basin, in the transition area between the Sahelo-Sudanian and Sahel zones. Production in the first phase is estimated at 20,000 barrels/day. A 311 km pipeline links the oilfields to the Djermaya refinery, 40 km north of N'Djamena (cf. Maps 4 and 5). It crosses the River Chari, which ensures the livelihood of numerous fishermen and the water supply for N'Djamena (1 million inhabitants), before flowing into Lake Chad. The lake harbours abundant natural resources (fisheries and others) that are nonetheless fragile due to their location in an endorheic basin (*i.e.* not connected to the sea). Depending on the latitude, the soil and land clearance, the steppe plant formations in the north gradually give way southwards to forest, wooded or shrub savannah. The Chinese oil project is located on terrain with little topographical variation, at an altitude of 300 m and a denivelation of less than 30 m. The pipeline crossings over the River Chari in Chad, and the Nile in Sudan, are particularly sensitive points.

In Niger, the Chinese project is located to the south-east of the country in a low rainfall area (100-300 mm per year), at the changing point between the Sahara and the Sahelian steppes, at the very heart of a future project for the protection of flora and fauna (Niger diaspora, 2008). This area is characterised by very specific biodiversity, harbouring in particular the last populations of wild addax^[187] and subspecies of dama gazelles. The small-scale oil project – which may be extended – involves a refinery situated close to a large urban centre (Zinder, Niger's second largest city). The refinery's future electricity production is intended to solve, or at least reduce, the country's

[187] The addax is an antelope, now very rare, that lives in the more remote areas of the Sahara.

energy problems.^[188] On the whole, the region affected by oil operations has a low population density: sparsely populated around Zinder (close to the refinery) and very sparsely populated around the oilfields (Agadem).

All three countries are marked by alternate dry and wet seasons of variable length (from May to October or June to September). Rainfall (very irregular from one year to the next) varies according to the latitude and the region. This mainly impacts the harvests, making it very difficult for much of the population to bridge the hunger gap. Irregular rainfall, fragile soils and soil erosion are characteristic of the entire region studied. Population density remains low, ranging from 9 inhabitants per square kilometre in Chad, to 12 in Niger, and 17 in Sudan (Bost *et al.*, 2009:346-357). If the very sparsely populated Saharan regions are excluded, these figures jump up but are still moderate overall. In all three countries, population density along the pipeline routes is low. In Sudan, however, massive population displacements have been associated with the oil operations, in a context that is plagued by geopolitical issues. In the Melut Basin, for example, a study revealed that 168 villages were impacted by such displacements (ECOS, 2006:19) (cf. *infra*).

The fact that oil facilities exist alongside mobile activities such as herding also creates problems, particularly in Sudan where certain pipeline sections are above ground. In Sudan, the oilfields straddle the north and south of the country, which creates a highly sensitive geopolitical situation. Oilfield geography played an important role in the civil war, as well as in the process that led to the creation of the new Republic of South Sudan following the January 2011 referendum. Environmental stakes played an important role in these events, particularly with respect to the future of the marshland or to population displacements (see for example, Prunier, 2009).

In all three countries, there is a clear geographical separation between upstream and downstream petroleum activities. In both Chad and Sudan, oil processing and upgrading activities are concentrated in the "North", whereas the extraction zones are in the "South". Here, the notion of "north" and "south" is not confined to a geographical location, but also encompasses the representation of a national territory (Magrin, 2001). Put very schematically, a distinction is often drawn between the areas with a mostly Muslim population in the North and the mainly Christian or animist populations in the South. After long years of turbulence,^[189] this has led to a greatly asymmetric

[188] A. Idrissa, « *Suite à la pose de la pierre de la raffinerie de pétrole de Zinder (Niger)* » (October 27, 2008), National Organisations Coordination Bureau for Transparency and Budgetary Analysis; « *L'ambassadeur de Chine vante la coopération entre son pays et le Niger* », (April 6, 2010), afriqueavenir.org; « *Raffinerie de pétrole pour le Niger et le Tchad* » (October 28, 2008), Voa News.

[189] On Sudan read: Lavergne, 1989; Prunier *et al.*, 2003; Johnson, 2006; on Chad: Buijtenhuis, 1987; Magrin, 2001.

access to the national, political stage. Most of the oilfields, now the keystone of the Sudanese economy, are located in the centre South, whereas all the refining and petrochemical activities are concentrated around Khartoum or Port Sudan. In Sudan, this sort of distribution gave rise to opposing interpretations. For the government in Khartoum, it represented a means of integration and national interdependence. For the opposition in the South, it was again a reflection of the North-South domination. Niamey, the capital of Niger, is not directly involved in oil activities; a pipeline connects the oilfields to Zinder. Here, the layout of the pipeline tends to follow an East West direction, while socio-political cleavages tend to reflect opposition between river people and desert people. The petroleum project, therefore, is far from being part and parcel of simple ethnic geopolitics: the area covered, has long been home to a mix of populations comprising Arabs, Toubous, Tuaregs, Haoussas and Peuls.

The oil projects in all three countries have another point in common: the oil exploitation zones are remote and difficult to access.^[190] In general, the oilfield infrastructure has been strictly limited to what is required for the construction phase or for access to pumping facilities and transport once a field is operational. In Chad, the town of Bousso is still hoping to benefit from the construction of a bridge over the River Chari.^[191] Pipelines are somewhat more easily accessible: during the dry season access poses no problems, but during the rainy season some tracks are very difficult to access. Dirt tracks and asphalted roads have been built by the different projects and this has greatly disenclaved some areas and encouraged trade.

In all three countries, the refineries have been sited on the outskirts of large urban centres already endowed with some infrastructure.

The Human Development Index (HDI) shows a low level of development for the three countries studied.^[192] All three display the same pattern of a two-speed economy split between a primary agricultural sector and a high-growth extractive sector – which further aggravates the imbalances typical of rentier economies (Magrin, 2011). Farming, herding and fishing are still the main sources of employment for large swathes

[190] The development of an oil project naturally depends on the location of the exploitable deposits, but also on the rules governing their access. Thereafter, the routing or location chosen for transport, storage and refining facilities will depend not only on flows and existing markets, but also on the forward-looking development policies that countries want, and are able, to negotiate with the oil companies. Many LDCs lack the autonomy required to develop such regulatory frameworks and policies.

[191] Interview with the Chief Administrative Officer of Bousso, in August 2010.

[192] With HDIs of 0.261 and 0.295 respectively in 2010, Niger and Chad are virtually at the bottom of the country list (167th and 163rd). Sudan has a slightly higher HDI ranking at 0.379 (154th), but this indicator masks very uneven development in the country (UNDP official site, accessed on 17 November 2010).

of the population in Sudan, Chad and Niger. At the start of this decade, herding accounted for 42% of Chad's primary sector production, and 15% of GDP. Before the advent of oil, farming provided 50% of primary sector production and 16% of GDP (ISM Consult, 2009a). The start-up of the Doba oil project raised high hopes for development at national level as well as in the oil-producing region (cf. Part 2), but results have been mixed. State investments further exacerbate the dysfunctions often seen at the beginning of extractive booms (Soares de Oliveira, 2007) and typically focus excessively on infrastructure and the capital city (Magrin, 2011).

In Niger, the oil adventure has only just begun with the CNPC project, but the country has already experienced the effects of this type of dual economy. Now the world's sixth largest producer of uranium, the country has essentially been living off its uranium rent since the 1950s. The rest of its economy is largely dominated by the primary sector, particularly extensive transhumant pastoralism. Groundnuts, millet and sorghum provide the staple diet. For a country that has not been self-sufficient since 1975, the economic prospects are gloomy and the trade balance remains largely negative.

In Sudan the concession of numerous oil blocks, mostly operated by China, have enabled the country to limit inflation and maintain a stable currency in a difficult global economic environment (Bost *et al.*, 2009; AFP, 2010). Although characterised by the same dual economy, Sudan stands out due to the extent of its oil activities (Fawzy-Rossano, 2006). Agricultural production, which is vulnerable to unpredictable weather conditions and insufficient to feed all of the population, nonetheless remains one of the country's main resources.

Thus, overall, the three countries are characterised by an agro-pastoral economy at the mercy of unpredictable weather conditions and by a background of poverty and conflict (past or present). Periods of drought in the 1970s and 1980s, together with the implementation of structural adjustment programmes, only added to their vulnerability. At the same time, dependency on foreign aid and/or on the price of raw materials (cotton and more recently oil in Chad, uranium in Niger, cotton and oil in Sudan) are very much a reality in these countries. Despite the many similarities, there are also a number of inherent differences that influence the role of environmental regulation in these three case studies.

5.2.2. The recent emergence of local environmental legislation

All three countries face a challenge in environmental management with the development of oil activities. Firstly, the multiplication of oil wells is in competition with agriculture and livestock farming for the use of land; and, secondly, pipelines are exposed to the risk of oil spills particularly when they cross humid areas or rivers. Managing these risks becomes potentially more challenging due to the uncertainty caused by a lack of security: in Sudan, despite an apparent end of the conflict, certain areas through which the pipeline runs remain unstable and make monitoring on the spot more difficult. In Niger, intermittent Tuareg rebellions and more recently action taken by the AQMI (Al Qaeda for Islamic Maghreb) group on the potential threat for oil activity; in Chad, the pipeline runs through areas which in the light of history do not appear to be politically unstable, but the country on the whole, has a rocky foundation.

In all three countries, the emergence of environmental legislation targeting the extractive industries has more or less kept pace with the development of projects in this sector.

In Sudan, while efforts were made to preserve the environment and natural resources prior to independence in 1956, progress in this field admittedly only occurred in the 1990s and early 2000s. Thus the Environment and Natural Resources Supreme Council for Environment, ENSCE, was set up in 1991 to supervise coordination of all questions related to the environment and natural resources. With the launch of the new national development policy (1992-2002), the environmental portfolio was promoted up to ministerial level in 1994 (Osman Mirghani, 2007:71). In Niger, the 1998 legislation made an EIE ^[193] mandatory for any firm wishing to operate in the extractive sector (Meynier, 2009:32). ^[194] In theory, an implementing decree specifies that the EIA should be carried out at the beginning of operations. During the exploratory phase, measures for managing the environment and local populations must be taken. In addition, Article 57 of Law No. 98-56 stipulates that extractive activities must be conducted in such a way as to ensure the protection of the environment as well as a rational use of natural resources. In Niger, the *Bureau d'évaluation environnementale et des études d'impact* (BEEEI – Environmental Assessment and Impact Studies Bureau) oversees regulation

[193] In the 1960s, no EIA was required for uranium exploitation either in Niger or in France.

[194] "activities, development projects or programmes, which by their magnitude or by their occurrences on the natural and human environment, can harm the latter, should be given prior permission by the Ministry of Environment. This permission is granted on the basis of (...) an environmental impact study carried out by the promoter", (Rural Code, Article 4, order 97-001).

in this field. A study is mandatory for all operations that extract or process energy-producing resources, as well as for the construction of oil or gas pipelines.^[195] In Chad, the current legislative framework is governed principally by the 1998 Law No. 14 defining the general principles for the protection of the environment, and by Law No. 6 of 2 February 2007 on fossil fuels (see Maoundonodji, 2009; and Part 2). As in Niger, Chad's environmental legislation requires that an impact study be carried out prior to the start of any extractive project.

The first EIA in Sudan^[196] dates back to the colonial period. In 1978, the Institute of Environmental Studies was set up and based at Khartoum University. As a result, Sudan has a scientific legacy conducive to reflection on the environmental impact of development projects. In the 1980s, Khartoum University conducted studies focusing on water projects and road construction. The frequency of EIAs increased mainly due to the advent of petroleum activities and their connected projects (1998-2006). Despite the vast array of sectoral laws on environmental conservation, EIAs were not mandatory at the beginning of the oil era, and only became so in 2001, when the Sudanese president finally signed an environmental protection act (Osman Mirghani, 2007:71).^[197] In the oil sector, several studies were conducted by the Institute of Environmental Studies. The GNPOC commissioned the Institute to carry out a series of assessments: two in 1998 (one on the El-Muglad production facilities and one on the El-Muglad-Bashayer pipeline), and another study in 2002 on the Munga and Bamboo oilfields. In 2004 and 2005, two studies were carried out on behalf of the Petrodar Operating Company (PDO) Sudan and concerned the development of oil operations in the Melut Basin and on the Bashayer 2 oil terminal.

With the coming of the oil era in Sudan, Chad and Niger, EIAs were gradually imposed by the different national laws and regulations. The impact assessment implies (i) a study of the initial state of the site and its human and physical environment, (ii) a description of the project and its foreseeable impact, (iii) a risk analysis along with appropriate

[195] Decree No. 2000-398/PRN/ME/LCD, Article 33 (Law No. 98-56).

[196] Although it was not officially designated as such, Moghraby states that this was the first EIA to be implemented in a developing country. Sudan was almost ahead of France on this count. On the other hand, the Jonglei canal project was so highly debatable with respect to its geopolitical ambitions, and proved such a failure (cf. Prunier, 2009), that questions could be raised as to the sense of the EIA carried out at the time.

[197] "Notwithstanding the Environmental Protection Act was passed in 2001. This is a policy-oriented framework legislation for the protection of the environment and natural resources. Article 17, Chapter III states 'Notwithstanding the provisions of any other law, with respect to permit by the competent authority for projects or programmes every person who desires to enter into any such project, as may probably affect the present environment and natural resources negatively, shall present an environmental feasibility study, signed on the part of the evaluation and follow-up committee, which is constituted by the Council (ENRSC)'" (Article 17, Chapter 3, "Environmental Protection Act").

responses (prevention, mitigation), and (iv) an environmental management and compensation programme (ISM Consult, 2009a:86–112). Whereas, in the area of environmental legislation, procedures have been instituted fairly recently in all of the three countries (particularly under pressure from donors, the World Bank or Eximbank), slight national differences have influenced the implementation of CNPC's projects.

5.3. Have country settings influenced the CNPC's environmental management?

In its 2009 annual report, CNPC presents the various actions it has taken in the area of environmental management. The "Environment and Society" chapter sets out nine key principles and describes the organisation of its HSE department (CNPC, 2009:16–20). In addition to environmental protection, the other points mentioned include operational safety, quality control, overseas community development, energy efficiency, public welfare undertakings, etc. Only a very general description of protective measures taken is given, without any precise examples outside of China. According to the report, progress has been made in emissions reduction, wastewater management and the discharge of oil-related pollutants and residues. At the same time, the company has explored certain aspects of the circular economy and cleaner production. Efforts were made to extend the industrial value chain of oilfield and refinery operations and to recycle and reuse wastewater. In the section on overseas community development, Sudan and Niger are cited as two examples. The stated goal is to establish a long-term partnership with host countries and local communities. This section refers to the creation of additional jobs, ongoing training for employees, improvement in people's living conditions and the contribution towards local socio-economic development (Osman Mirghani 2007:20). In Sudan, CNPC funded a project centred on education, poverty reduction and improved living conditions.^[198] In Niger, the company mentions that it has made special efforts to preserve the environment during oilfield operations, particularly to protect vegetation and soils. It has also launched a project to plant different species of trees to extend the green area in the Agadem oilfield, in the hinterland of the Sahara.

The section of the report on oil operations in Africa only briefly mentions the progress of CNPC's current projects on the continent (particularly in Niger, Chad and Sudan). In Sudan, CNPC has begun an environmental protection project whose current phase aims to reduce atmospheric oil-related pollution and to build a treatment plant for

[198] Although CNPC presents a series of initiatives in the section on community development, the report does not specify either the area of intervention or the scale of these projects.

wastewater from the Khartoum refinery. Once treated, this water will be reused for agricultural purposes. The company also highlights its success in laying an underground rather than an aerial pipeline (using horizontal drilling) to cross the River Chari in Chad, which thus minimises the impact on the river and its valley. For CNPC, this example is an illustration of its responsible attitude towards environmental protection (Osman Mirghani, 2007:52).

Apart from CNPC's annual report, it is only in Sudan – where the CNPC has fifteen years of experience behind it – that the company has published a specific document on its activities. The document affirms CNPC's commitment to limit and reduce the environmental impact of its operations. This includes the production process and the use of new technologies in order to attain clean production. In 2009, all discharges of gas, wastewater and solid waste material were compliant with international and Sudanese standards. According to the report, all exploration and production operations in blocks 1/2/4, 3/7 and 6 comply with ISO 14001 standards. The biggest biodegradable wastewater treatment plant was built in the Heglig fields and the treated water will be recycled for irrigation. This plant, which received ISO 9001 certification, is considered by CNPC as a model of environmental protection (CNPC, 2010b:16). At the Khartoum refinery, USD 27 million have been invested in environmental protection during its ten years of operation. The refinery is described as *"A Pearl of the African Continent"* (CNPC, 2009: 16–20) and an example for other countries to follow. CNPC says that it has complied with Sudanese standards on atmospheric and noise pollution. The company has also gradually invested in a vast tree plantation project in order to create a green belt around the refinery.

These documents give the impression that environmental regulation is dealt with in a similar way in all three countries. Yet, the operational context and the specific legacy of each country in terms of environmental rules and mechanisms have certainly influenced project implementation.

In Niger, the CNPC project lies within a zone that is currently being classified as a protected area. The difficulty here thus involves reconciling oil activities and the conservation of the rich biodiversity found in this climatic transition zone. Though both of these projects affirm that their goal is to fight poverty, they do not have the same challenges or timescales. On the one hand, oil fuels hopes for national economic and social development; the country expects to resolve its present energy crisis with the help of this integrated Chinese project. On the other hand, the direct economic benefits of conserving a natural area are very limited in the short run, which raises the question of immediate priorities (Meynier, 2009). So far, Niger has had no prior

experience in oil, but it could well draw on its long experience of uranium mining. Certainly, the fact that the sensitive issues raised by extractive activities are similar could help the national stakeholders, whether these are acting on behalf of the State or civil society, to manage relations with the Chinese company.

In Chad, an entire system for environmental and social risk management (EIA, EMP) was set up within the framework of the Exxon-Doba project. The press coverage, the scale of the project and the various stakeholders all helped to deepen the different learning experiences (cf. Part 2) at a national level. The withdrawal of the World Bank hastened the collapse of the State's environmental monitoring capability, but the project nevertheless enabled civil society, consultants, government officials and Exxon executives to gain a great deal of experience. The Doba project established a very high level of regulation and continues to leave its imprint on the popular imagination of Chadian society. People trained under the Doba project were subsequently recruited as environmental consultants by CNPC (cf. Part 4). While the Rônier project does not involve the same stakeholders as the Doba project, it does impose an implicit reference for all the key players involved in Chad's oil sector.

In Sudan, recent decades have been marked by conflict and lasting instability in certain regions of the country. Chevron discovered oil at the end of the 1970s and early 1980s, but interrupted its activities on the outbreak of the second Sudanese civil war in 1983. The departure of the Western majors opened the way for CNPC's arrival in the following decade, in 1996. In this conflict situation, implementing EIAs and assessing oil operation impacts became an arduous task. In 2005, a Comprehensive Peace Agreement was signed between the Khartoum government and the South of the country (CPA, 2005).^[199] This was intended to respond to concerns about the impact of the oil industry on the environment and the South Sudan communities (Tudtel, 2010:6). One of the main aims was to set up a National Petroleum Commission in order to manage the oil industry. Directives pertaining to oil resource sharing and environmental protection were issued. Jointly chaired by the president of the Government of National Unity (the Sudanese president Omar El-Béchir) and the president of South Sudan, the commission is responsible for drawing up and enforcing rules for the development and management of the oil sector. In theory, the agreement stipulates that communities neighbouring the oil zones be consulted and included in all contract negotiations and compensation processes.

[199] The agreement was signed at the end of the second Sudanese civil war (1983-2005). It set an interim period of six years to be followed by a referendum organised for January 2011. It was then that the South Sudan population chose to separate from Sudan to create an independent State.

Until now, responsibilities for enforcing and overseeing environmental legislation have not been clearly assigned. Despite uncertainties, the signing of the CPA triggered a change in Sudan's approach to the environment. The environmental management efforts made under the various CNPC projects could usefully be consolidated within the new setting of a Sudan split into two separate States following the referendum in January 2011.

5.4. Implementation: limits and lessons learnt

5.4.1. *Environmental issues overshadowed by economic and political concerns*

In so-called "normal" conditions, it is no easy matter to develop and enforce environmental regulation; difficulties are further aggravated when the context is marked by conflict and instability (cf. Van Vliet, 1997:11-25). CNPC's arrival in Sudan, in the midst of conflict, was not conducive to compliance with environmental standards. Following the withdrawal of different Western companies such as Chevron, Shell or independent companies like Arakis Energy Corporation or Talisman, CNPC very quickly became the foremost player in the Sudanese oil sector and still maintains a leading position. Negotiations between the Chinese company and the government are most often handled by a single representative from each side. For Sudan, this is the Secretary General of the Ministry of Petroleum, who has been delegated full authority to act.^[200] According to various reports, exploration and production contracts have ignored environmental protection and community rights (ECOS, 2006; Tutdel, 2010; Coalition for International Justice, 2006; UNEP, 2006a; USAID, 2007). While Chinese firms claim that they have carried out an EIA for some of the blocks, these documents have not been made publically available (Meynier, 2009), and public debate is theoretically one of the key principles of EIA processes. At the same time, confidentiality reigns over all contract negotiations thus making verification of the related clauses impossible.

Concerning oil projects, the lack of transparency in these three countries is the same as in most countries of the world. In fact, transparency is the core demand of civil society, as it wishes to be cognisant of the exact terms of contracts (Sani, 2010; VOA News, 2008). Most of the time, political agendas overrule all else and lead to the hasty completion of the construction phase to the detriment of a prior environmental assessment. Such is the case in Chad, for example, where the Rônier project is considerably advanced (end 2010) even though the EIA has not yet been fully approved by

[200] Interview with Ismaël Moctar (independent consultant) in N'Djamena, August 2010.

the Ministry of Environment (cf. Part 4).^[201] The upcoming elections might explain why the government is pushing CNPC into a tight schedule. All three countries show the same tipping of the scales towards economic and political interests rather than towards environmental concerns.

Whereas the media coverage of the Doba project helped Chadian civil society to organise itself, the discreet profile of the Rônier project makes advocacy work all the more difficult. In addition, the remoteness of oil zones does not make matters easier for local NGOs, which are embryonic and of limited number in the Chinese exploitation zone in Chad (GRAMPTC, 2010: 31), and even non-existent in the oil zones in Niger (Meynier, 2009). In Sudan, particularly in the Melut Basin, difficult access and lack of infrastructure in certain areas heighten the dangers facing the NGOs. During periods of conflict, these were often directly threatened and thus unable to continuously monitor environmental issues and the rights of the local population (ECOS, 2006:723).

Whatever the circumstances, CNPC's main communication channel is with the central government. Neither the territorial administrations nor the customary authorities are able to ensure effective environmental monitoring, and local civil society even less so (ECOS, 2006; Tutdel, 2010; Coalition for International Justice, 2006; UNEP, 2006; USAID, 2007), which is a sign of the privileged ties that this Chinese state-owned company has forged with the central power in the three countries studied.

In Sudan, against a backdrop of war, compensation and population displacement have led to serious problems; in Niger and Chad, the situation seems manageable despite various misunderstandings. According to diverse sources, the arguments of the local communities affected by the various oil projects in Sudan went unheard during the negotiating phase. As for displacement, the inhabitants of several villages located in the Chinese oil exploitation zone in the Melut Basin were forcibly evicted by the government army or militias during the oilfield development phase between 1999 and 2002 (ECOS, 2006:19). In Chad and Niger, the oil projects are located in relatively uninhabited areas and the main issue is thus compensation for loss of cropland. Most often, the local communities complain about the compensation rates and criteria as well as late payments. The Sudanese government had promised that these communities would be relocated to sites equipped with basic services and housing but, according to ECOS, this never happened (ECOS, 2006:19). Since the

[201] The EIA for the refinery was authorised, while the EIA for the oilfields and pipeline were forwarded to the Ministry of Environment in October 2010.

signing of the CPA, some of the villagers who had found refuge in regional centres began to return to their former villages. As this area is extremely marshy in the rainy season, the inhabitants usually build their villages on slightly elevated sandy ridges. In the meantime, however, most of these easily accessible locations had been occupied by Petrodar to build roads used by the consortium (Reeves, 2003).

The Petroleum Commission set up in 2005 under the CPA has a very narrow margin of manoeuvre. The Government of National Unity and the Government of South Sudan have very different legal systems and neither has the mandate to handle environmental problems that predate the signing of the agreement. Also, the Commission has no mechanism to compensate the populations affected by oil operations. Given the confusion reigning at jurisdictional level in Sudan, national environmental monitoring is proving very complicated and consequently the CPA is no more than a dead letter. In both Chad and Niger, the State's supervisory bodies are a recent phenomenon and not sufficiently well established to make their presence felt in an institutional landscape dominated by the petroleum ministries. The financial and human resources they are allocated are still not sufficient for them to carry out satisfactory monitoring of oil activities.

5.4.2. Divergences and prospects in the environmental field

At first sight, the Sudanese experience appears to have had no tangible impact on the recent projects in Chad and Niger. Moreover, the comparison between CNPC's arrival in Sudan in 1996 and the launch of new operations is a difficult exercise. Depending on the country, the size and scale of projects vary and CNPC disposes of different margins of manoeuvre.

The Sudanese case may not have directly helped CNPC to manage the environmental challenges in the other two countries, but the company may have drawn some general lessons from this experience. For the moment, CNPC's major challenge is to reduce the technical lag compared to Western majors and to project the image of a competent and environment-friendly company. Due to strong international pressure in Sudan, CNPC does appear to have developed its capacity for dialogue at both the political and environmental level. In Chad, on the other hand, in a somewhat more peaceful setting, it seems that this know-how, and particularly regular contacts with civil society, have still not been put in place.

According to the CNPC report, a certain number of measures were taken to encourage and increase local employment in Sudan. At the end of 2009, the proportion of Sudanese workers employed on oil projects exceeded 95%, with 75% in engineering,

construction and other oilfield services. In total, the number of jobs created is over 80,000 (CNPC, 2009:20). CNPC also provides training programmes for young graduates in electronics, civil engineering, welding, etc. Selected candidates receive training at a local unit of CNPC's Engineering and Construction Company (CPECC, a CNPC subsidiary). Successful students have the opportunity of signing a work contract. Since 2005, workshops have been organised in cooperation with the Sudanese exploration and oil production authority in order to train Sudanese technicians. The Khartoum refinery provides training opportunities not only for its employees but also for students from universities and other institutions. At the same time, promising directors and technicians are sent to China or third countries for additional training (VOA News, 2008). One might have thought that the size and duration of the Sudanese operations would have facilitated technical training and exchanges between the Chad and Niger sites, but this is restricted to the technical personnel, with the transfer of engineers from one CNPC project to another. The HSE staff are sourced from China or from previous Chad-based projects run by other firms with local staff (cf. Part 4).^[202] Thus, fifty young Chadians from the Chad refinery were trained in China and not in the neighbouring country.

In Sudan, the results of the 2011 referendum have posed a challenge for environmental regulation. For CNPC the task is daunting as several of its oil blocks are located in South Sudan (for example, the Heglig and Muglad fields among others). In the centre of Sudan, a very small area has been explored with only a few wells now on stream. Prior to the 2005 agreement, exploration was restricted to the fringes of the North-South border, under military control (UNEP, 2006b:144). Now that some degree of stability has been restored, exploration has been extended to the rest of South Sudan and south Darfur. Most of the large unexplored areas lie in the southern part of the country and it is quite likely that sizeable oil projects will start up over the next ten years. Furthermore, the CPA made no mention of how the oil sector was to be governed if the result of the referendum did not match the outcome desired by the government (Tutdel, 2010:18-19). But this is exactly what happened. In the field of environmental oil regulation, as in other fields, the implications of an independent South Sudan State is a subject that requires further research.

Until 2011, environmental management has thus followed a case-by-case logic. Yet, if the oil projects in the different Central African countries were interlinked, then CNPC would be more likely to adopt a more regional approach. Niger's oil deposits are in

[202] In Chad, most of the HSE staff is from the HSE Department of the Canadian company Encana, some people from China and former Chadian executives from Exxon.

scattered enclaves and to make production viable multiple oil wells would need to be drilled (ECOS, May 2006; Tutdel, 2010; Coalition for International Justice, 2006; UNEP, 2006; USAID, 2007) and the investment required would make it necessary to export the crude. As the country is landlocked, the company has several options: exportation via Nigeria, Benin, Algeria or through an eventual connection with the Exxon Mobil pipeline in Chad (cf. Map 6).

In Chad, it may be advantageous for the Chinese to connect their oil fields to the pipeline built and operated by Exxon. Shipping conditions are being negotiated with the Chad government and the Doba consortium. At the same time, other options, albeit more costly and riskier, are being negotiated with a French company. The idea would be to connect the CNPC pipeline in Chad with the transport system in Sudan. Although the environmental standards for Doba are defined in the IFC loan agreement, the question is how and at what level these would be applicable to Chinese operations in case of a link-up between the CNPC and Exxon Mobil pipelines (cf. Parts 3 and 4).

A comparison of the Chinese oil operations at different stages of production raises questions for van Vliet's set of hypotheses on van Vliet's hypotheses on mining cycles (1998). These show how the operators' strategies, the state of the facilities and the negotiating capacities of affected local communities evolve over time. In principle, at the outset of all extractive operations, job creation is at its highest level and the negative social and environmental impacts are not (yet) visible. As the production cycle advances, firms are less and less inclined to pay indemnities and to respond to the demands of the local population. At a same time, NGOs and other organisations need time to organise themselves and develop the requisite skills to defend the interests of local communities. Plotted on a chart, this temporal mismatch shows two opposing curves; one rising and one falling. The difference between these two curves expresses the population's unexploited potential at the beginning of the cycle and the heightened tensions towards the end of the cycle due to the companies' reluctance to engage in dialogue (van Vliet, 1998). So far, these hypotheses have mainly been tested using extractive projects led by Western companies. But are they also applicable to Chinese companies?

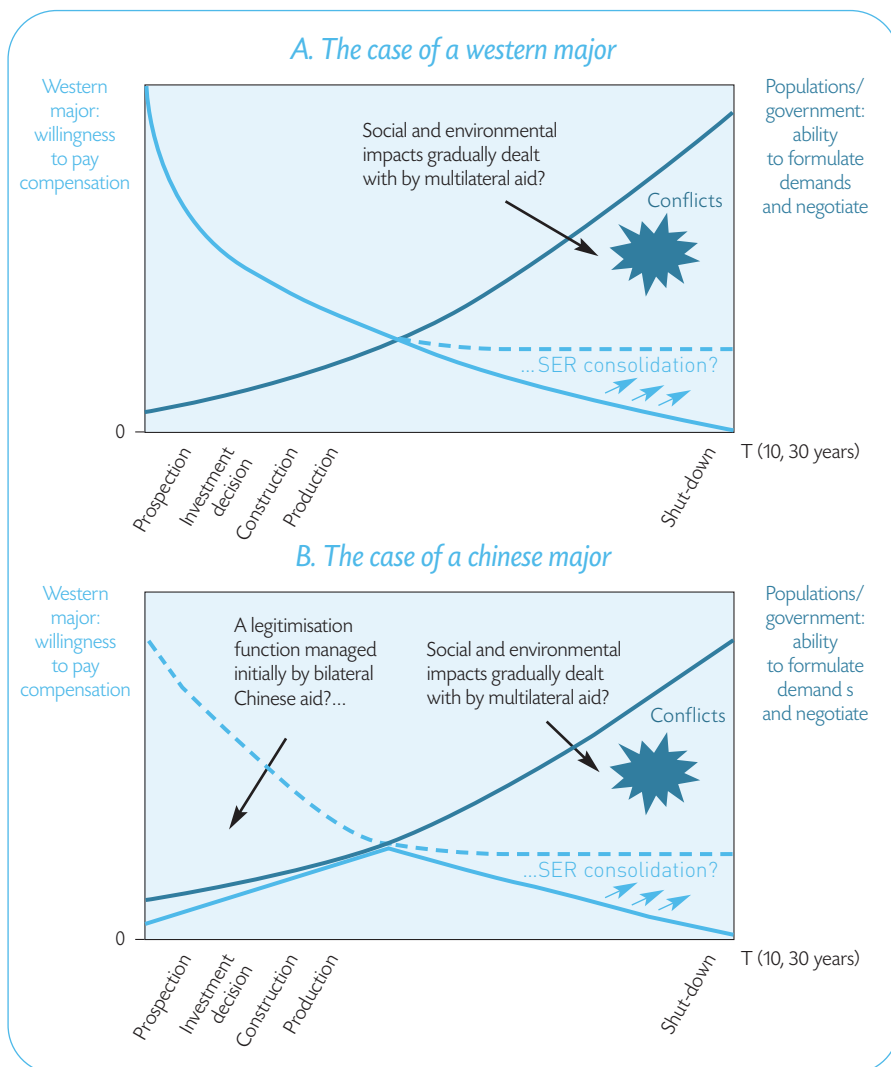
An analysis of CNPC oil operations in Sudan, Chad and Niger reveals certain traits that diverge from the model. In all three cases, oil contracts were negotiated directly with the country's central authority. Due to the special relationship with the host country's central government and the strategic importance of extractive projects for China, CNPC is little inclined at the outset to interact with the local populations. Compared to Western majors, Chinese oil firms are still in a learning phase and their public relations departments are taking more of a backseat. CNPC's initial imple-

mentation of its operations in Sudan, in a context of conflict, illustrates the secondary importance it attaches to cooperation with civil society and local communities. For the time being, the two projects in Chad and Niger, still in the construction phase, convey the image of company that sets priority on respecting the technical schedule and on relations with the host government, but not on engaging in dialogue with local community representatives.

In Sudan, however, under pressure from international opinion and after securing its investment, CNPC has gradually shown itself to be more amenable to interaction with local communities and is making efforts to project a positive image of its activities. In Figure 2 (update of van Vliet's initial hypotheses, 1998), we have attempted to illustrate the salient features of the interaction between Chinese oil companies and national and local players (affected populations, government), by comparing them with the behaviour typical of Western firms. At the beginning of the cycle, the Chinese oil company seems prepared to offer only very low amounts of compensation (compared to Western firms), as the legitimisation it needs at the start of the cycle is already secured by China's bilateral cooperation (this type of practice is no longer accepted by Western countries, but western firms have now learnt to mobilise multilateral aid, as in the case of Exxon in Chad). However, the willingness of the Chinese firm to grant higher compensation gradually increases in response to growing demands. We advance the hypothesis that, over a long time-scale, the strategies of Western firms and of Chinese firms will slowly converge, leading notably to an increased propensity to grant compensation (consolidating SER practice) and a common mobilisation of multilateral aid to manage or prevent adverse impacts and their consequences (conflict). Heightened competition between Chinese and Western operators in the production of new environmental standards cannot be ruled out.^[203]

[203] In Sudan, the oil cycle is indeed more advanced but persistent conflict has made it a very special case.

Figure 2 *Strategies of Western and Chinese oil companies' in Central Africa: towards convergence?*



Source: van Vliet, Dittgen and Magrin, 2011 (update of initial hypotheses made by van Vliet, 1998).

5.5. Conclusion

China's energy needs and the increasing presence of Chinese firms on the world stage are clearly visible in the ramping up of CNPC's oil operations in Africa. CNPC is involved in three onshore projects in the Sahel region of Central Africa. The company has a composite but firm presence in Sudan alongside two smaller projects operating in Chad and Niger.

Beyond the requirement of profitability, environmental regulation in the oil sector is becoming a growing challenge for companies. With the emergence of environmental awareness in China and the profusion of increasingly complex environmental standards for the extractive sector, the question arises of how CNPC is operating in the different African countries. At first glance, the evidence seems to point to environmental practices mainly inspired by the Sudanese experience and which can be transferred to Chad and Niger. However, when CNPC first arrived in Sudan, conflict was rife and the times hardly conducive to regulation, which did not encourage a high level of regulation at the outset.

The ecological and geopolitical environments of all CNPC projects bear a certain resemblance, even though country-specific political trajectories and environmental backgrounds have influenced the national styles of environmental regulation. In Chad, CNPC has to deal with the firmly rooted environmental legacy of the Doba project. In Niger, the Chinese oil project has to take into account its overlap with a protected area. In Sudan, CNPC's reputation was first exposed to international criticism in a context of conflict. Thereafter, the peace treaty between the North and South has allowed environmental regulation to make headway and with the independence of South Sudan a whole gamut of new opportunities has opened up.

Consequently, CNPC does not have the same margin of manoeuvre in all three countries. The fact that the projects in Sudan are large-scale and longstanding has given the Chinese company greater independence in environmental management. The company's subsidiaries in Niger and Chad have a more limited independence as most decisions are made at the head office in Beijing. Despite national regulations, political agendas tend to take precedence over environmental monitoring. Generally speaking, the resources allocated to the monitoring and oversight of environmental concerns still seem to be lower when compared with those of the Western majors.

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Conclusions

General conclusions

Geert van VLIET and Géraud MAGRIN

We began this study after realising, during a first attempt at dialogue with CNPC in 2008, that we knew virtually nothing about the way in which Chinese state-owned oil firms developed and managed the environmental side of their activities, particularly when these were located outside China, and more specifically in Africa.

Today we still cannot claim to know much more. The subject is vast and will require a great deal of further research work, which will need relentless efforts to overcome the difficulties involved, particularly in the area of communication. Nevertheless, we would like to share some of the conclusions that we have drawn as a result of our study approach, which took us from Beijing to N'Djamena *via* the Rônier project oilfields and the neighbouring villages.

We started out with the following question: do Chinese state-owned oil firms take advantage of their less stringent social and environmental requirements to gain a foothold in territory thus far occupied by the Western majors? Or, on the contrary, does CNPC use SER concepts to improve its global competitiveness? What environmental rules does CNPC effectively follow outside of China? How do these influence interactions with host country governments and Western firms?

In China, the gap between demand and supply of environmental regulation has been greatly reduced: norms and standards have advanced and environmental management practices are now widespread. This trend has received further impetus from the combined pressure of citizens facing the environmental impacts of growth, from companies' demands for greater autonomy (which implies greater self-regulation) and due to the country's increasing participation in world trade – the corollary to this being China's exposure to international practices in private and public environmental management. In response to the still perceptible difficulties in implementing environmental standards, China adapted its system by setting up the State Environment Protection Agency (SEPA), later to become the Ministry of Environmental Protection. This current trend towards the fleshing out of norms and standards should continue, but any real improvement in environmental indicators would undoubtedly require closer scrutiny of the actual model that China has chosen to steer its environmental issues. In this respect, new prospects have opened up with the recent provisions in

Chinese legislation for the creation of independent monitoring mechanisms, the participation of universities, and the encouragement of greater participation by environmental NGOs and various non-governmental sources of expertise.

Over the last decade, the Chinese oil and gas sector has seen an improvement in environmental regulation driven by the dual influence of internal demands and external needs. The current rules of the game provide a basis for stimulating environmental management practices within the petroleum sector. CNPC, in particular, has met the growing challenges of environmental regulation by building on the frame of reference it has acquired through its own experience in China and overseas. The gradual implementation of standards and more specific private and public procedures will further strengthen this practice of environmental regulation. As in the Western world, the growing complexity of oil technology will very quickly overtake the capacities of a national agency responsible for environmental regulation, however official it may be. Apart from the need to set up an independent monitoring body endowed with the relevant regulatory procedures, material and human resources and requisite authority, respect for the environment in the oil sector will depend not only on the progress companies make in the area self-responsibility but also on their ability to open up new spaces for dialogue with civil society.

Environmental regulation in Chad was in a state of crisis well before the advent of the petroleum era. The launch of the World Bank-backed Exxon-Doba project helped to create a rich heritage of rules of the game for the oil industry, particularly in the environmental sphere. These rules added to the layers of earlier environmental regulations (customary laws and state regulation prior to the oil era). The weakness of the Chadian State put the Exxon-led consortium under additional and constant pressure to adopt the practice of self-regulation, honed by the watchful eye of civil society. Despite the more controversial aspects of the Doba experience, the project charted a relatively promising course for environmental regulation. But is this sufficient to trace a virtuous trajectory?

Observations made midway through the construction phase of the Chad-based Rônier project (2009–2010) shed light on the encounter between the environmental regulation dynamics at work in China and Chad, as well as on the nature of the project in question. In its current phase, the Rônier project is a relatively small-scale industrial project (with a production capacity of 20,000 barrels/day and connected to a refinery by a 300 km pipeline) geared towards Chad's domestic market and facing the environmental challenges commonly found in the oil industry. It is based on a composite frame of reference for environmental regulation, which draws on Chinese standards,

themselves influenced by the international and Chadian rules crafted at the time of the Doba project. The negative and positive impacts seem less pronounced than those produced by the Doba project. This can be explained by the fact that the Rônier project is less sensitive in socio-political terms, by the different scales of the two projects and by the host country's demand for environmental regulation. However, the cumulative effects of the activities already studied and those that are planned (power plant, industrial zone, additional drilling, the Komé-Kribi pipeline connection) have not been adequately taken into account. The lessons learnt from the Doba project by the Chadian State and its people have helped to improve the level of environmental regulation implemented: in Chad, CNPC does not seem to have the leeway – had it so intended – to adopt the classic double-standard approach. When CNPC arrived in Chad in 2007, its environmental management was framed by Chinese environmental regulations, monitored by senior-level HSE bodies within CNPC, the State Council and China Eximbank. In the course of our research on CNPC in Chad, we found no evidence to confirm Soares de Oliveira's (2008) claim that Chinese companies use the argument of less stringent environmental standards to gain access to markets.

The major difference between the two projects brings us back to our initial question regarding the specificity of the environmental regulation implemented by Chinese firms. From an empirical point of view, we found that communication on environmental issues was relatively limited. The EIA, which is often used by Western firms as a key tool to ensure communication between a project and its host environment, was mainly used here as an in-company steering tool. This explains notably ^[204] why the EIA process failed to comply with the schedule recommended by Chadian legislation, which stipulates that the EIA process is to be completed before the start of construction works. The specific role of communication in the implementation of the project is worth putting in perspective.

Western firms have developed their legitimisation function, or “shell” function, by skilfully leveraging multilateral cooperation operations to their advantage (World Bank or regional bank projects); it legitimises the fact that the firms from participating countries have access to the goods and services markets created by grants or loans. On the basis of our earlier work carried out in settings dominated by Western firms, we had assumed that, as CNPC was in the initial phase of its oil cycle in Chad, it would be open to researchers, NGOs and the affected population and that it would have

[204] The political dimensions of the project, which came out of a cooperation agreement between the Chinese and Chadian governments, offer another explanation: compliance with the EIA schedule was negatively impacted by a very tight agenda.

a well-staffed HSE department to facilitate these contacts (including a large team in charge of communication and community relations). In other words, we assumed that CNPC had set up a mechanism akin to the legitimisation function found in Western firms.

However, in CNPC's Rônier project, the role and size of the department responsible for building up this legitimacy seemed restricted, even at the outset of the oil cycle. Although the "production" and "legitimisation" functions in CNPC are clearly separate, the "legitimisation" function, especially in environmental matters, plays a limited and barely visible role in the organisation. In our view, CNPC's "legitimisation" function is part and parcel of the Chinese bilateral cooperation programme with Chad, much on the lines of the tried-and-tested model that underpinned Western bilateral cooperation until the 1980s. This function is thus ensured by the Embassy in the shape of infrastructure grants or the promotion of industrial partnerships as in the case of the Chad refinery. This will likely be the case in the future unless CNPC develops its own "legitimisation" mechanism. This could emerge from a new context in which China would get the multilateral organisations (of which it is now a member) to assume the role of legitimising its access to industrial and trade operations, much like the role these organisations now play for the sole benefit of Western countries.

So far, only a few Western majors or OGP member companies have been capable of introducing new technologies, new approaches and internationally recognised procedures. These companies know how to handle their relations with the media and national or supranational regulatory authorities, and also find their way around the maze of self-regulated umbrella organisations within the oil sector. They have thus seen their efforts as producers of new "best practices" rewarded. However, attaining this level of recognition requires more than just "best practice": it also requires the ability to communicate, convince and win acceptance and this is a know-how that CNPC has still to acquire. If it fails to open up to communication and dialogue, which today constitute a key dimension of the HSE function for oil majors, CNPC will be unable to move from its present role of consumer of international standards and norms to that of producer. The immediate challenges facing CNPC would be to develop approaches and procedures conducive to dialogue with the surrounding stakeholders, and to rethink the status that HSE departments are given within its hierarchy at company and group level (particularly sufficient autonomy for them to give early warnings and satisfactorily complete the required consultation processes).

These hypotheses will naturally need to be tested against the company's prospects for its Chad-based oil operations, which are still highly uncertain. The Rônier project,

as it stood when we carried out our research in 2009–2010, will most probably be extended, with the CNPC increasing its oil production for export. Among the different scenarios, the most realistic will likely involve linking up CNPC production facilities with the Exxon-Doba pipeline. A physical connection of this kind would pose a major challenge in terms of dovetailing the different regulatory systems. It would require a global understanding that encompasses knowledge about the history of both projects and the American, Chinese and Chadian frames of reference for environmental regulation.

These perspectives call for a different approach to the questions raised by the relations between Chinese and Western firms in Africa. The initial prevailing analyses reduce them to no more than fierce competition that mainly leads to environmental dumping harmful to the host countries. However, the dynamics that we observed do not confirm this conception. On the contrary, it seems that they are furthering another form of integration that opens up the global playing field to Chinese extractive firms, as evidenced by the possible connection between the Rônier project and the Exxon-Doba pipeline, by the co-operation already underway between CNPC and Total in Mauritania and China, and by the possible partnership between Areva and a Chinese firm to exploit the Imouraren mine in Niger. These partnerships could help to reinforce environmental regulation. Quietly and in its own way, the Rônier project may well have opened the door to other major projects.

Appendix

Appendix/Questions

At their request, questions were sent in writing *via* e-mail to the officers of the China Development Bank, Eximbank and CNPC. We did not receive a formal reply to these questions. We have included them below as they provide an insight on our approach and the queries that arose in the course of this research.

Questions sent to China Development Bank and Eximbank China

1. Introduction. Could you provide basic information on types of financial instruments (equity participation, loans); conditions and rates; repayment periods; specifically in the oil and gas sector; specifically in Africa; and more specifically in Chad? If not directly involved in loans for oil, gas, or mining activities, is your institution involved in infrastructure projects in support to these extractive activities?
2. Which are the environmental standards and regulations applied in your institution, specifically in the extractive industries, specifically regarding the oil and gas sector, or regarding related infrastructure or other related investments? Access to these documents would be more than welcomed (in Chinese or in English).
3. Relations of the environmental standards and regulations in your institution with other standards and regulations:
 - with standards and regulations proposed by multilateral organizations of which China is a member (IMF, IFC, World Bank) or with Regional development banks like the African Development Bank. Are there striking similarities or differences?
 - with standards and regulations proposed by private organisation like the International Association of Oil and Gas producers (OGP, of which CNPC is not yet a member).

How do you deal with the co-financing of operations of Chinese companies working within consortia composed of firms that are member of the OGP? How do you deal with these multiple standards in those cases?

4. What are your experiences with the enforcement of environmental regulations within the operations of your Institution, specifically in the oil and gas sector in Africa? When is it more easy to enforce environmental regulations: during identification, appraisal, or upon implementation of the loan or investment? What are the main lessons from your experience?
5. As Eximbank has been involved with a loan to the Chadian government in order to allow for its participation in the refinery project (joint venture between CNPC and SHT), could we have access to publicly available information regarding the following aspects: objectives and components of the project, amount of the loan, repayment schedule and conditions?
6. Could you provide us with publicly available information regarding the environmental regulations Eximbank has requested for this loan, in particular regarding the environmental impact evaluation, environmental management plan and oil spill prevention plan?
7. Could you confirm whether Eximbank has adhered to, or otherwise follows the Equator principles?

Elements for a dialogue between CNPC and the study team (sent to CNPC, N'Djamena, Beijing, 2010)

Project description

Based on publicly available information, could you provide a description of the Rônier project: related to the refinery (in partnership with SHT), the pipeline and the oilfields?

Based on publicly available information, could you inform us which firms are involved in the Rônier project? Is this a consortium similar to the case of the Doba project?

Based on publicly available information, could you inform whether the Eximbank or other Chinese financial institutions have been involved in the project?

Based on publicly available information, could you provide basic information on the planning of the building and operation schedule or the Ronier project?

Based on publicly available information, what are the respective roles and responsibilities of CNPC and Chadian government in the Ronier project regarding environmental management (monitoring, control, oil spill management)?

Based on publicly available information, what is the allocation of tasks and roles between CNPC and SHT regarding the management of environmental issues in and around the refinery?

Based on publicly available information, which contractual obligations regarding environmental management did the CNPC inherit when it acquired the exploration and production rights from ENCANA?

Could we have access to the Environmental Impact Assessment for the different components of the Ronier project?

Could we have access to the Environmental Management Plan?

Could we have access to the Accidental Oil Spill Prevention Plan?

HSE rules and proceedings (intentions and practice)

Formal intentions regarding environmental regulation:

Which environmental norms and standards does CNPC apply in Chad? Which references (Chinese, Chadian, others) have been chosen for the different aspects of the project (industrial norms, environmental norms, social norms)?

What factors do influence the choice of Chinese, Chadian or international standards?

Did Eximbank or other involved financial agencies influence the choice of environmental standards implemented by CNPC (if yes, in what sense)?

Are there differences between HSE policies and procedures for HSE in Chad with respect what CNPC usually does in China? From your point of view, what is the role of HSE rules and procedures in the operations of CNPC in Chad?

Are there certain points where Chadian laws (Petroleum code, environmental code) differentiate from CNPC standards? Could you give an example?

Are there cases where Chadian environmental or social laws are stricter than Chinese laws?

How do you operate if the Chadian laws are less strict than CNPC standards?

What is the approach of the CNPC regarding the elaboration of EIA, EMP, and other environmental instruments? (The CNPC appears to have elaborated very concise EIA and EMP, compared to the voluminous texts realised by Exxon)?

Practice of implementation/enforcement of environmental regulation

Who is in charge of taking care of environmental issues regarding the Ronier project?
What are the different roles?

How are the EIE, EMP and other basic documents translated into practical operational procedures? Can we have access to examples of operational procedures for field staff?

Who is in charge of monitoring and control of all environmental related procedures?

If confronted to a new situation and not foreseen within the EIA or EMP what standard would you apply?

Internal organisation/HSE staff

How is the HSE staff organised? How many people are working in this department?
How do you divide up your work?

In regards to environmental awareness campaign, in what way does the internal communication work (training course, experience)? In which language?

From your point of view, does the HSE department have sufficient influence in terms of regulation and management within the CNPC operations in Chad? In general, HSE staffs in OECD firms do complain that HSE procedures (particularly the Environmental dimension in HSE) are considered a burden for the “engineers”. Can you tell me more about your experience as HSE staff? In which way do you manage to convince overall staff of the importance of HSE policies and procedures?

Are there any awareness campaigns for local population in terms of environment?
Are there safety instructions for them during the construction phase of the project?
In which way are these instructions carried out (panels and/or village meetings)?

Do you think the rules in terms of environment and pollution in Chad are clear?
Applicable? Applied?

Is there any evolution regarding the intentions and practice of environmental regulation within CNPC? What are the milestones that marked the changes in terms of management of environmental issues within the organisation?

How does CNPC adjust itself to environmental problems encountered in Chad and in Africa?

Does the host environment influence the application of environmental standards (regional approach for standard application or influenced by national context)? Do home standards always prevail?

In terms of environmental management are the decisions centralized in Beijing, or is there a certain independence of operational subsidiaries from headquarter?

Management of social impacts

What is CNPC's approach to employment?

Recruitment policies? Role and perspectives of local labour?

Wage policies?

How is the work on CNPC's activity sites in Chad organized? (Interactions between Chadian and Chinese employees?)

How does CNPC manage the migration dynamics, the question of resettlement? In which way are compensation policies (individual compensation and community compensation) carried out?

What is CNPC's policy regarding the involvement of local population and authorities in the surroundings of the project?

Oil operations are complex. In which way are the different actors involved (CNPC, Chadian government, civil society) adapting to difficulties? Could you provide examples of learning?

Comparison and perspectives

Does the company intend to apply lessons (in terms of HSE) learned in Chad to other operation fields? Otherwise, are there solutions that were applied in a similar context mobilized in Chad in order to answer potential problems?

Is Exxon Mobil's experience in Doba and the heritage of Encana's former Rônier project in any way influencing CNPC's activities in Chad? How would you describe the interactions between CNPC International Chad and other petroleum companies (meetings, workshops, etc)?

How does CNPC's experience in other operation sites in Africa influence the implementation of the Rônier project?

In the annual report of CNPC Sudan, the Khartoum refinery is described as “the pearl of the continent”. How important is this experience for the implementation of the Djermaya refinery?

What are the relations and interactions (workshops, meetings, general policies, engineer exchange) between different operation sites of CNPC in Africa?

List of acronyms

List of acronyms

AFD	<i>Agence Française de Développement</i>
ANSI	American National Standards Institute
API	American Petroleum Institute
AQIM	Al Quaeda In the Islamic Maghreb
AQSI	Administration of Quality Supervision, Inspection and Quarantine (China)
ARC	Africa Rice Center
ART Dev	<i>Acteurs, ressources et territoires dans le développement (UMR)</i>
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BEEEI	<i>Bureau d'évaluation environnementale et des études d'impacts (Niger)</i>
BELACD	<i>Bureau d'études, de liaison des actions caritatives et de développement (Chad)</i>
CBCSD	China Business Council for Sustainable Development
CBRC	China Banking Regulatory Commission
CCSRP	<i>Collège de contrôle et de surveillance des ressources pétrolières (Chad)</i>
CEFOD	<i>Centre d'études et de formation pour le développement (Chad)</i>
CEI CNPC	East China Design Institute
CERDI	<i>Centre d'études et de recherches sur le développement international (France)</i>
CILSS	<i>Comité inter-états de lutte contre la sécheresse au Sahel</i>
CIRAD	<i>Centre de coopération internationale en recherche agronomique pour le développement (France)</i>
CIRC	China Insurance Regulatory Commission

CITES	Convention on International Trade in Endangered Species
COTCO	Cameroon Oil Transportation Company
CMS	Convention on Migratory Species
CNODC	China National Oil and Gas Exploration and Development Corporation
CNOOC	China National Offshore Oil Corporation
CNPC	China National Petroleum Corporation
CNPCI	China National Petroleum Corporation International
CNPP	<i>Coordination nationale du projet pétrole</i> (Chad)
CNY	Yuan, Chinese currency
CPA	Comprehensive Peace Agreement (Sudan)
CPECC CNPC	China Petroleum Engineering and Construction Corporation
CPPL	<i>Commission permanente pétrole locale</i> (Chad)
CPPN	<i>Commission permanente pétrole nationale</i> (Chad)
CROSCAP LC	<i>Collectif des réseaux et organisations de la société civile en appui aux populations locales du Loug Chari</i>
CTNSC	<i>Comité technique national de suivi et de contrôle des aspects environnementaux des projets pétroliers</i> (Chad)
DRC	Development Research Center of the State Council (China)
ECMG	External Compliance Monitoring Group
ECOS	European Coalition on Oil in Sudan
EIA	Environmental Impact Assessment
EITI	Extractive Industry Transparency Initiative
EMP	Environmental Management Plan
EMS	Environmental Management System
ENSCE	Environment and Natural Resources Supreme Council for Environment (Sudan)

EPB	Environmental Protection Bureau (China)
EPC	Environment Protection Comittee (China)
EPDs	Environmental Protection Division (China)
EPL	Environmental Protection Law (China)
EPOZOP	<i>Entente des populations de la zone pétrolière</i> (Chad)
ESR	Environmental and Social Responsibility
EXIMBANK	Export-Import Bank (China)
FACIL	<i>Fonds d'action concertée d'initiatives locales</i> (Chad)
FDI	Foreign Direct
FGEG	Facts Global Energy Group
FROLINAT	<i>Front de libération nationale du Tchad</i>
FYP	Five-year Plan
GB	<i>Guo Biao</i> (National Standards), (China)
GDP	Gross Domestic Product
GIS	Geographic Information System
GME	Gravity, Magnetic and Electrical
GNPOC	Greater Nile Petroleum Operating Company (Sudan)
GNP	Gross National Product
GRAMPTC	<i>Groupe de recherches alternatives et de monitoring du projet pétrole Tchad-Cameroon</i> (Chad)
GTZ	<i>Deutsche Gesellschaft für Technische Zusammenarbeit</i>
HDI	Human Development Index
HJ	Environmental Standards (China)
HSE	Health Safety and Environment
IAG	International Advisory Group (Chad, Cameroon)

IBRD	International Bank for Reconstruction and Development
ICG	International Crisis Group
IDA	International Development Association
IDREC	<i>Institut de recherches sur l'économie de la Chine</i> (France)
IFC	International Finance Corporation
IMF	International Monetary Fund
ITRAD	<i>Institut tchadien de recherches agronomiques pour le développement</i>
IUCN	International Union for the Conservation of Nature
ISO	International Organization for Standardization
LDC	Least Developed Country
LPG	Liquefied Petroleum Gas
LUMAP	Land Use Mitigation Action Plan (Chad)
MEP	Ministry of Environmental Protection (China)
MOFCOM	Ministry of Commerce (China)
MWR	Ministry of Water Resources (China)
NARMA	Network for Applied Research on Mining, Oil and Gas Activities
NDRC	National Development and Reform Commission (China)
NEA	National Energy Administration (China)
NGO	Non-Governmental Organisation
NPA	National Popular Assembly (China)
NPC	National People's Congress (China)
OD	Operational Directive
OECD	Organisation for Economic Co-operation and Development
OGP	International Association of Oil and Gas Producers
OHSA	Occupational Health and Safety Management System Specification

OIMS	Operations Integrity Management System
ONDR	<i>Office national de développement rural</i> (Chad)
PBC	People's Bank of China
PDCA	Plan, Do, Check and Action (Management model, China)
PDOG	Petrodar Operating Company (Sudan)
PRODIG	<i>Pôle de recherche pour l'organisation et la diffusion de l'information géographique</i>
RDP	Regional Development Plan
RESAP	<i>Réseau de suivi des activités pétrolières</i> (Chad)
SAC	Standardization Administration of the People's Republic of China
SAIIA	South African Institute of International Affairs
SASAC	State-owned Assets Supervision and Administration Commission of State council (China)
SEA	Strategic Environment Assessment
SEPA	State Environmental Protection Administration (China)
SER	Social and Environmental responsibility
SFA	State Forestry Administration (China)
SHT	<i>Société des hydrocarbures du Tchad</i>
SINOPEC	China Petroleum and Chemical Corporation
SITE	School of International Trade and Economics (Beijing, China)
SME	Small and Medium Enterprises
SNE	<i>Société nationale d'électricité</i> (Chad)
SOA	State Oceanic Administration (China)
SOE	State-owned enterprise
SRN	<i>Société de raffinage de N'Djamena</i>
STE	<i>Société tchadienne des eaux</i>

STEE	<i>Société tchadienne d'eau et d'électricité</i>
STT	Société tchadienne des textiles
SY	<i>Shi You</i> (Petroleum Standards) (China)
TETIS	<i>Territoires, environnement, télédétection et information spatiale</i> (UMR)
TOTCO	Tchad Oil Transportation Company
UIBE	University for International Business and Economics (Beijing, China)
UMR	<i>Unité mixte de recherche</i> (Joint Research Unit)
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VOA	Voice of America (News)
WHO	World Health Organisation
3S	"Three Synchronisations" Programme

Earlier publications in the series

- Focales No.1:** *Accès de tous aux services d'eau : le rôle des petits opérateurs privés à Hô Chi Minh Ville, Vietnam*
- Focales No.2:** *Le système de gouvernement local en Palestine*
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What is AFD?

Agence Française de Développement (AFD) is a public development finance institution that has been working to fight poverty and support economic growth in developing countries and the French Overseas Communities for seventy years. It executes the policy defined by the French Government.

AFD is present on four continents where it has an international network of 70 agencies and representation offices, including 9 in the French Overseas Communities and 1 in Brussels. It finances and supports projects that improve people's living conditions, promote economic growth and protect the planet: schooling for children, maternal health, support for farmers and small businesses, water supply, tropical forest preservation, fight against climate change, among other concerns.

In 2011, AFD approved nearly €6.9 billion to finance activities in developing countries and the French Overseas Communities. The funds will help get 4 million children into primary school and 2 million into secondary school; they will also improve drinking water supply for 1.53 million people. Energy efficiency projects financed by AFD in 2011 will save nearly 3,8 million tons of carbon dioxide emissions annually.

www.afd.fr

The environmental challenges facing a Chinese oil company in Chad

The surge in Chinese investments in Africa has brought about a flurry of questions expressing concern over their ecological impact in the host countries. Still, the principles and implementation of environmental management by Chinese firms remains largely unknown. This work, born of a unique partnership between European, Chadian and Chinese researchers, is an attempt to provide some insight on this subject, based on a case study in Chad, on a project that was initiated in 2009 by the leading Chinese petroleum firm, the CNPC.

For an understanding of the way in which the firm deals with the environmental challenges in this country, this book first focuses on the recent progress made in China in the field of public and private environmental regulation (including the petroleum sector), then describes how this influences environmental management as put into effect by the CNPC, in Chad, during the construction phase. An analysis of the influence of the World Bank-backed Exxon project sheds light on the interaction between Chinese, Chadian and Western approaches to environmental issues. The authors have also highlighted the role of improved communications and transparency between the project proponents and other stakeholders (local communities, civil society, national media).

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